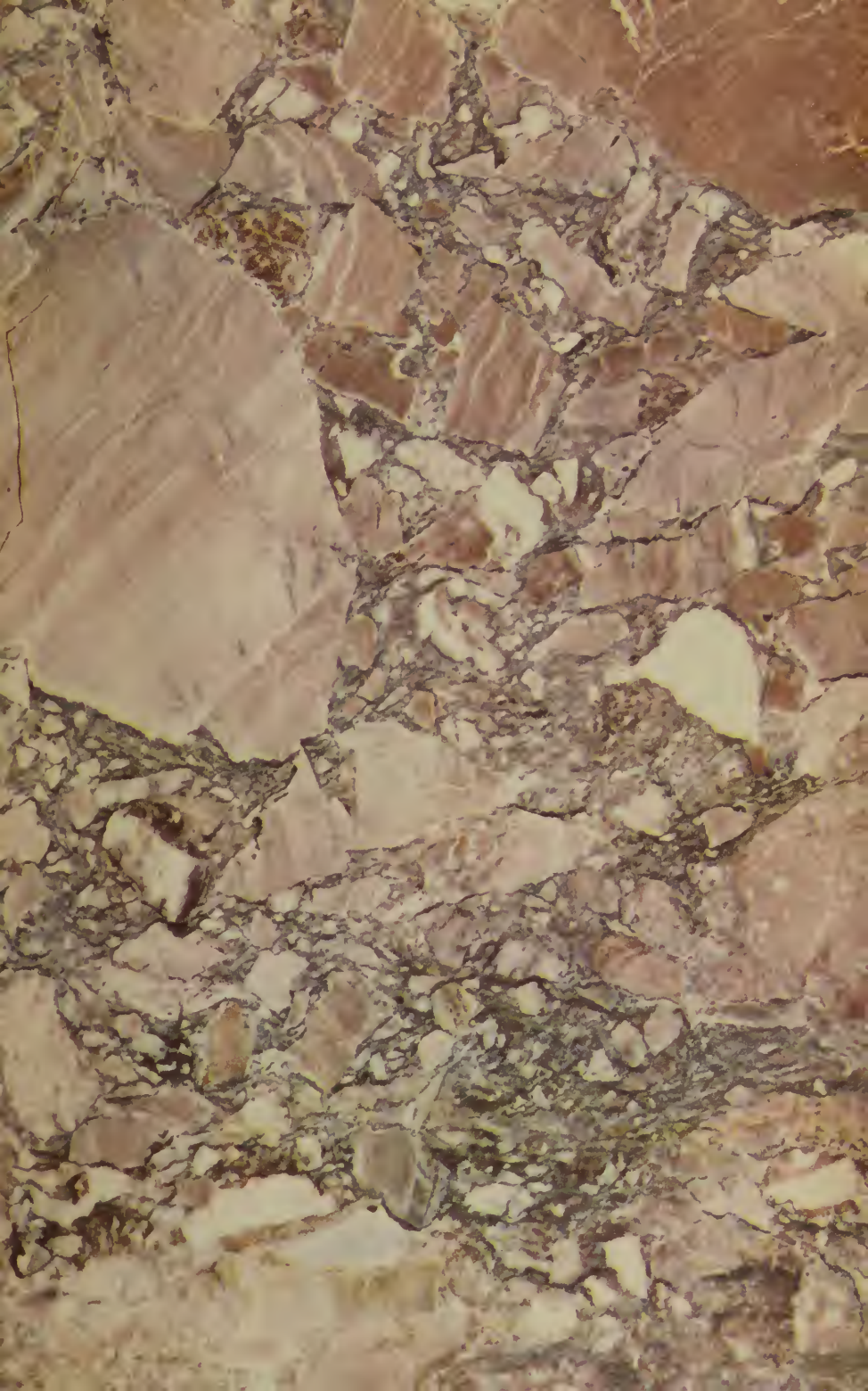

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3.

REPORT OF A COMMITTEE

OF THE

MASSACHUSETTS MEDICAL SOCIETY

ON

SPOTTED FEVER OR CEREBRO-SPINAL MENINGITIS

IN THE

STATE OF MASSACHUSETTS.

MAY, 1866.

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PRELIMINARY REMARKS.

At the Annual Meeting of the Massachusetts Medical Society, held May 31st, 1865, it was Resolved, "That a Committee of one from each District Society be appointed by the President, whose duty it shall be to report at the next Annual Meeting of this Society, upon the prevalence of the disease called 'Cerebro-Spinal Meningitis, or Spotted Fever.'"

The Committee, as subsequently appointed, consisted of Dr. Luther Parks, of Suffolk County, Chairman; Dr. G. W. Doane, of Barnstable County; Dr. N. S. Babbitt, of Berkshire; Dr. Charles Howe, of North Bristol; Dr. F. H. Hooper, of South Bristol; Dr. E. P. Fearing, of Dukes and Nantucket; Dr. Wm. D. Lamb, of North Essex; Dr. H. O. Stone, of South Essex; Dr. J. W. D. Osgood, of Franklin; Dr. P. L. B. Stickney, of Hampden; Dr. A. W. Thompson, of Hampshire; Dr. Ephraim Cutter, of East Middlesex; Dr. N. B. Edwards, of North Middlesex; Dr. Alfred Hosmer, of South Middlesex; Dr. C. C. Tower, of Norfolk; Dr. H. N. Jones, of Plymouth; Dr. Joseph Sargent, of Worcester; Dr. T. R. Boutelle, of North Worcester.

In the notifications sent to us of our appointment, it is stated that the "subject submitted to the Committee" is "Spotted Fever in Massachusetts." Therefore, though the resolution above quoted directs us, in general terms, to report on "the prevalence of the Disease called 'Cerebro-Spinal Meningitis' or 'Spotted Fever,'" it is the history of that malady as it has occurred in *this State* that we have especially investigated, and upon which we now offer our report.

REPORT.

THE SPOTTED FEVER OF 1806 TO 1815.

Some half a century ago there prevailed in Massachusetts and other parts of New England, an epidemic called "Spotted" or "Petechial Fever;" and we must necessarily begin with some notice of that. By the direction of the Massachusetts Medical Society, a report upon that epidemic was in the year 1810 drawn up by a committee, on which were some of the most distinguished names in our profession. And though the question whether the Spotted Fever of 1810 was the same as the epidemic of to-day which is called by that name, has not been hitherto settled, yet notwithstanding the respectful distance of fifty-six years intervening between the report of 1810 and that of 1866, it is with sentiments of the utmost deference and diffidence that we find ourselves, in some sense, the successors of such names as James Jackson and John C. Warren.

In relation to that report, the writer of this has been favored with a letter from, and a personal interview with Dr. Jackson, by whom almost the whole of the former one was written. Our venerable father in medicine warns us to receive some of the statements quoted *cum grano salis.* He reminds us that the morbid anatomy of fifty years ago was not what morbid anatomy is now; that observers may have

sometimes erroneously thought they saw what they expected to see; that on opening the brain, for instance, they may have pronounced that to be vascular congestion, which at the present time would not be considered a morbid appearance.

The materials for his report, Dr. Jackson says in his letter, "were furnished by a very few of the persons to whom queries were addressed, the same in kind as those in your first circular, but the replies were very few, and gave more opinions and theories than facts, so far as I recollect." . . . "In later years, I have met with a single case now and then, which I regard as the *old* spotted fever. I had one singular case, two or three years ago, in a school-master under the care of Dr. J. W. Warren." . . . . "About 1853, a very singular case occurred in a woman, domestic in my own house. Her disease was a very brief one, and it was after her death that I came to a conclusion about it. I have not any notes of these cases."

The above statement of Dr. Jackson that he had seen sporadic cases of spotted fever, occasionally, since the epidemic of 1806 to 1815, we regard as a very interesting one.

It might be thought superfluous to offer, for re-publication here, anything which had already been printed in the Transactions of this Society. But we feel compelled to reproduce, among other citations, extracts from the report of the committee of 1810 (copies of which are rare), for the sake of comparing the old spotted fever with the recently prevailing disease which has received that name.

The "old" Spotted Fever first attracted attention by its appearance in the town of Medfield, Massachusetts, in 1806. Between the 8th and 31st of March, 1806, nine cases occurred in that town, all of them fatal. It then showed itself in other parts of the State and also of New England, subsequently extending itself to New York, Pennsylvania and Canada; also to Kentucky, North Western Virginia, and finally to the southern extremity of the United States. The

Committee's report, presented June 21st, 1810, traces its course in Massachusetts for the preceding Winter and Spring. After saying that the first part of the Winter, as also the Summer and Autumn of the year before, had been remarkably healthy throughout the country, it states that the disease appeared first in the town of Dana, about the beginning of the year, but not in any considerable number of instances until during the cold weather after the middle of January. It is then heard of at Petersham in the latter part of February, and at Barre, Oakham, Rutland, Paxton, Hardwick, New Braintree, Brookfield, Spencer, Sturbridge, Winchendon, Athol, Gerry, Leicester, and Worcester, in the course of the month of March, mostly about the third week in that month. The above mentioned towns are all in the county of Worcester. It occurred in Cambridgeport, Middlesex county, in the suburbs of Boston, on the 24th of March, and in April at Lancaster, county of Worcester. In the course of April and May a few cases occurred at Boston, and "perhaps an equal number in proportion," in the counties of Worcester and Middlesex. During May it appeared in Springfield, Hampshire county, and had not subsided in the second week of June.

Most of the country above indicated is, the Committee point out, inland and very elevated, having many fresh water ponds and streams. In Cambridgeport the disease was mostly confined to land which had been recently salt-meadow, and intersected by foul ditches. In Boston this disease, as also "typhus," had occurred mostly in those parts of the town near the flats and water.

On the whole, however, the epidemic was found to have occurred in seasons differing in their meteorological character, and in places very various in their soil and climate.*

* The authority for this statement is an unpublished manuscript of Prof. O. W. Holmes, which, together with valuable books, he most kindly lent me to aid in drawing up this report. L. P., Jr.

Drs. Bigelow and Holmes, in their edition of Marshall Hall, give the following summary of the symptoms of the disease; viz., sense of lassitude, great prostration, faintness at stomach, sinking of the pulse, coldness of surface, occasionally chills, pain in the head, coma, delirium or convulsions, vomiting, in some instances approaching that of cholera morbus, and the appearance of *petechiæ*, or spots of effused blood beneath the epidermis. To this should be added the not unfrequent occurrence of severe itching of the surface. Dr. North* mentions sore throat as a premonitory symptom to be found with but few exceptions when inquired for; so slight, however, that most patients do not mention it unless questioned. Redness of the throat and aphthæ were sometimes observed.

The eruption which gave the name of Spotted Fever to the disease was not constant, and was less frequent in the year 1808–9, than in the two years preceding. Dr. Henry Fish, giving an account of the disease in Hartford in 1809, says that in that place it was without spots, at least before death. The Committee of 1810 say it was not easy to determine in how large a proportion of subjects the skin was affected with spots and eruptions. One of their observers had seen only four instances of cutaneous affection in eighty cases, while another estimated it to have occurred in two thirds of all his cases. This last reporter, however, we are told, included very slight affections.

As to the character of the eruptions, the Committee say they were very various: such as red spots only, miliary eruptions, blotches, vesicles, sometimes resembling blood blisters, pustules, and rarely purpura, petechiæ, or vibices. Sometimes there was an appearance like measles. Dr. Strong says the spots did not rise above the surface, nor recede upon pressure. They appeared upon the face, neck, and extremities, and frequently over the whole body.

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* North on Spotted Fever, 1811.

The invasion of the disease, say the Committee, is generally sudden and violent. In its course all the functions of the body are more or less interrupted, and often some of them are entirely suspended. The subject of it is seized in the midst of his usual labor or occupation, and oftentimes is struck down suddenly, almost as by a stroke of lightning. The first symptoms are various, such as local pain or paralysis, delirium, or coma, and rarely spasms or convulsions. Sometimes, though less often, says Dr. Hale,* the inception was slow and gradual, occupying several days. But, in whatever form the disease began, there ensued, and generally suddenly, great prostration of strength—a point much dwelt upon by writers.

The access often consists of shifting pains. The patients suddenly feel a pain in one joint or one limb, often in a finger or toe, in the side, stomach, back, or head. Sometimes the sensation is like the stinging of a bee, frequently it is most excruciating pain which at once arrests and commands the whole attention. This pain moves from place to place without losing its violence, generally approaching the head, and it is often confined to one side of the body.†

Observers concur in stating that every symptom was not to be found in every case. On the contrary, there was great variety in the symptoms, and great variety also in the order in which they occurred.

In the Committee's report, the only mention we find of

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* Hale on Spotted Fever, 1819.

† In a work of Drs. Miner and Tully on Fevers (1823), is a notice of an epidemic which had prevailed for the eight years previous to 1822, in some parts of Virginia, and which the authors consider to have been a typhoid pneumonia. In that set of cases, there were some in which, instead of the chest, various other parts of the body would be affected with "a most excruciating pain." The attack occasionally began with pain in a *finger* or *toe*, or other parts of the extremities. In this connection, we will mention that Dr. James Jackson informs the writer that about the time, or shortly after the subsidence of the epidemic known as "Spotted Fever," which we are now describing, there prevailed in Vermont a pneumonia of a typhoid character, which had many characteristics in common with "Spotted Fever."

opisthotonos is in the following passage: "Spasms which frequently occur and shift suddenly as the pain does from part to part; sometimes resembling hysteric spasms, sometimes occasioning the head to be drawn back as in *opisthotonos.*" But Dr. North mentions among "the more unusual symptoms" "a kind of clonic spasm of the muscles of the neck" (p. 15). He also says (p. 129) in the bad cases there were pain of the head and universal distress and agony, which would cause children to draw back their heads. Dr. North relates the case of Hannah Dresser, æt. 20, who in a relapse of the disorder had frequent spasms, sometimes of the limbs, sometimes of the neck, "drawing her head back like opisthotonos;" also that of Andrew Ellicott, æt. 6, who had strong spasms frequently recurring, by which his head was drawn backwards "like a person affected with *opisthotonos.*" In this case the opisthotonos was subsequently replaced by a strabismus. Again, Dr. Samuel Woodward, of Torringford, Conn., in a paper quoted and commented upon by Dr. North in his book, mentions, among "the violent symptoms" observed in his own "experience," that the head was "drawn back with spasms." President Fitch also speaks of "pain and rigidity of the muscles of the neck *often*," and says the head is in many instances bent backwards.

Relapses occurred in many instances, but were rarely if ever followed by death.* And, according to Dr. North, the disease was not self-protective. He gives a case of a patient who had spotted fever in 1808, and again in 1810.

Fatal cases terminated in twelve, twenty-four, or forty-eight hours. In favorable cases reaction took place, and a mild fever of uncertain duration followed.†

The disease was of various degrees of severity: in a large proportion of cases very mild; in some severe, and, in a few, destroyed life "like the plague." The communica-

* Dr. Holmes's unpublished writings.

† Drs. Bigelow and Holmes in Marshall Hall's Practice of Medicine.

tions made to the Committee of 1810 related to the disease in its gravest forms.

With regard to the fatality of the malady, the Committee of 1810 say they were unable to make "any accurate statements," but that at the first appearance of the disease in the County of Worcester a very large proportion of those affected with it died at an early period of the affection. After it had extended more widely, its violence diminished, and the proportion of deaths became very small. The Committee say that women in different stages of pregnancy have been known to recover from severe attacks of spotted fever.

Statements differ as to the influence of age and sex, except that neither very young infants nor aged persons were so subject to the disorder as persons in middle life. Nothing further was ascertained upon the question of the causes, save that it prevailed mostly in cold weather, and that there was *no suspicion of its contagiousness.*

As to the treatment pursued in the old epidemic it may be worth noting that the extreme prostration led to active stimulation (which was carried by some practitioners to an absurd excess; to the extent of a quart of brandy, for instance, in eight hours); and that the free use of opium was commended by some, as it has since been by late Continental writers in what is called by certain of them "*epidemic cerebro-spinal meningitis*"—the malady which is now prevailing among us, under the name of "cerebro-spinal meningitis," or "spotted fever." There were of course, at the period when the disease of which we are writing prevailed, practitioners who, like Dr. Gallup, used blood-letting and other antiphlogistic remedies; but the general sentiment seems to have been that spotted fever was an asthenic affection, and should receive a supporting and stimulating treatment.

Autopsies in this epidemic were not numerous. Dr. Hale, in his large experience of it in Gardiner, Maine, did not

obtain one. The Committee of 1810, however, give reports of a few. The post-mortem appearances may be summed up as follows:

HEAD.

In some instances turgescence of the cerebral vessels was the only lesion found. This was generally in cases of short duration, i. e. in which death occurred in from twelve to twenty-four hours. In cases of longer continuance, there were found bloody points in the medullary substance of the brain, effusion of serum, the arachnoid and pia mater remarkably altered in appearance by the effusion of an opaque substance between them, "which may be called coagulated lymph, or semi-purulent lymph. This substance was frequently of the yellowish color of pus, with a consistence between the tenacity of lymph and the fluidity of pus." At other times it resembled well characterized lymph. There was sometimes adhesion of the hemispheres of the brain to the dura mater and to each other.

THORAX.

The Committee say that in every instance of which they were cognizant, the small vessels of the surface of the heart were beautifully injected. Lymph was sometimes found on the pericardium; and the endo-cardium was "occasionally altered from its healthy texture." Less frequently traces of inflammation were found on the pleuræ. In one case which is given below, the cavity of the thorax was the seat of very considerable disease, including apparently pulmonary congestion.

ABDOMEN.

The liver and spleen, says Dr. Holmes (op. cit.), are reported "to have been distended in various degrees, and free from any morbid change except an extremely livid color. The state of the stomach and intestines is so imperfectly

described that it is hardly possible to draw any conclusion respecting the morbid changes they may have undergone."

By way of illustration, we now give from the report of the Committee of 1810, descriptions of three autopsies which were performed by the late Dr. JOHN C. WARREN. With the first of these we copy the brief record of the symptoms. The second was the case referred to above, as showing marked traces of inflammation in the chest.

CASE I. The patient was a child of Mr. Gleason, aged eighteen months. The child, from being perfectly well and playful, was suddenly attacked with shivering fits, became stupid, and gave symptoms of severe pain in the head and back. Its skin when first noticed was livid and cold, but afterwards hotter than natural, though the heat did not continue long, and was succeeded by an unusual coldness. The tongue was coated with a light-colored mucus. The stomach was nauseated, and occasionally ejected such matters as had been lately swallowed. At the end of about twenty-four hours, the child exhibited some favorable symptoms. The pulse, which was before very much depressed and irregular, became distinct and less variable; the countenance was reanimated; the coma was succeeded by a return of sensibility sufficient to enable the child to recollect those around it. These flattering appearances lasted but a short time; the coldness and insensibility returned, the pulse became imperceptible, and the patient sunk in about thirty hours from the attack.

Dissection, nineteen hours after death.

EXTERNAL APPEARANCE.

The body exhibited on its anterior parts a considerable number of irregular purple spots, and a few regular ones. The back part of the trunk was of a very deep and uniform purple color.

HEAD.

The superior longitudinal sinus was full of dark-colored blood, which had partly coagulated. The external surface of the dura mater had nothing remarkable. When this membrane was divided, a quantity of serum was discharged, which was transparent on the left side, and bloody on the right. The child had been on the latter side from the moment of attack. The bloodvessels were not very full of blood; for a large quantity had been discharged from the 14
longitudinal sinus. These vessels were generally covered by a substance, which accompanied them in the greater part of their course, bearing a resemblance to coagulated lymph in consistence, but approaching pus in color. Besides these portions there were many smaller masses situated in various places between the pia mater and tunica arachnoides, especially near the vertex and between the hemispheres of the brain. The thin coats were glued to the dura mater at the upper edge of the hemispheres, and the hemispheres were so strongly connected by these coats under the falx, as to require the aid of a knife for their division.

The superior parts of the cerebrum being removed, so as to expose the medullary substance, this was seen full of small red points, placed in clusters, which increased in size after a few minutes. The lateral ventricles were quite full, but not over distended with serous fluid. The plexus choroides was swelled but of a pale color, and its velum interpositum thickened by the same kind of lymphatic substance which has already been described. The third and fourth ventricles exhibited no peculiar appearance except the water which they necessarily contained. The superior part of the cerebellum and the inferior part of the cerebrum and cerebellum had a large quantity of the yellow colored lymph. The base of the cranium contained serous fluid. The consistence of this brain was healthy.

THORAX.

The lungs were of a light color on the fore part, and dark behind, as is usual in healthy lungs after death. Their consistence was natural. Their contents were a proper quantity of frothy mucus. The heart was very firmly contracted. The right cavities were full of black blood, and the left empty. The vessels on the surface of the organ were minutely injected with blood.

ABDOMEN.

The liver was large and turgid, and of a very livid color. On dividing it, great quantities of black blood were poured out. The gall bladder was moderately full of yellowish bile. The external and internal coats of the stomach had a perfectly healthy appearance. Its contents were a dark-colored fluid of vinous smell, similar to that of the substances taken before death. The coats of the small intestines were healthy. Their contents were yellowish in the first portion, and green near the cæcum. In the latter was a large dead lumbricus. The large intestines contained flatus without any offensive smell, and a considerable quantity of well-digested fæces. The spleen and pancreas had nothing remarkable. The kidneys were quite turgid, and discharged urine on being pressed. The bladder was full of urine.

The muscular fibres were livid, and of a natural strength. The blood was very dark colored, and coagulated after being discharged from the vessels.

Case II. The next case was that of a man æt. 39, of a robust habit. The attack began with a chill three days after an exposure to rain, while he was much heated by working. Among the symptoms were cough, attended with a copious expectoration of "mucus of a common appearance," difficult respiration, and great "uneasiness about the breast."

AUTOPSY.

EXTERNAL APPEARANCE.

The body became covered with irregular purple marks of various size, about half an hour after death. The face was turgid, and this part and the shoulders were very livid. The blistered parts were quite dark colored and bloody.

HEAD.

The hemispheres of the brain adhered by their thin coats to the dura mater, and to each other. Between each of the meninges was some serous fluid, and an effusion of coagulated lymph. The last was most conspicuous over the blood-vessels, which were full of dark blood. The cortical substance was pale. The lateral ventricles were much larger than natural, from being distended by a transparent serum. The meninges at the basis contained coagulated lymph, and under them was a quantity of serum.

THORAX.

The fore part of the lungs was covered with a very thick layer of yellow coagulated lymph, which extended from the pleuræ of the lungs to the pleuræ of the ribs, fixed these two parts together, and then passed along the side of the cavity toward the spine. The right cavity contained a quantity of pus which was judged to amount to thirty-two ounces. The substance of the lungs was rather firm; yet they had not that kind of hardness which is produced by common inflammations of the lungs. The surface of these organs was shrivelled. Their color was peculiarly livid and unhealthy. The degree of firmness they possessed may be attributed to their containing more blood than is usually collected in those parts after death. The pericardium had a very little water. The heart was inflamed on the anterior face, and had a thick flake of coagulated lymph near the apex, and another on

the origin of the aorta. The cavities were equally filled with coagulated blood.

ABDOMEN.

When this cavity was opened there was not any very offensive odor emitted. The stomach was perfectly healthy in every respect, and did not contain any fluid. The intestines were in a healthy state. The liver was shrunk, and that part of its coat next the diaphragm bore marks of slight inflammation. The gall bladder was quite distended with dark tenacious bile. The rest of the abdominal viscera exhibited no remarkable appearance except the urinary bladder, which was distended with urine.

The blood and the muscles were of an exceedingly dark color.

In the above case inflammation of the meninges was complicated with inflammation of the serous membranes of the chest, together with probable congestion of the lungs.

CASE III. The subject of the *third* case was forty years of age—of good constitution.

EXTERNAL APPEARANCE.

The petechiæ were less distinct than before death; the vesicles and efflorescence disappeared. The countenance and eyes not much altered.

HEAD.

The meninges of the brain contained a small quantity of serous fluid, and also a very considerable and uniform effusion of coagulated lymph. The hemispheres adhered to each other. The ventricles were full, but not over distended with water. In the basis of the cranium was a considerable quantity of yellowish fluid. Under the cerebellum and the

tuber annulare lay two large masses of lymph which compressed those parts, and indented themselves in their substance, especially flattening the last-named part.

THORAX.

The lungs had a healthy aspect. They were anteriorly light, and posteriorly dark colored. The heart was inflamed. The minute branches of the coronary arteries were rendered distinct by blood thrown into them. Near the apex and on the origin of the aorta were exudations of lymph. The valves of the organ were opaque; the cavities empty; but the aorta was full of black blood.

ABDOMEN.

The liver was of a good color and moderately distended with blood. The gall bladder was full of dark, tenacious bile. The stomach had two or three small spots of inflammation in the mucous coat; it contained some dark-colored fluid, and a little greenish mucus. The small intestines were in a healthy state, except a part, which was rather more red than the rest. The large intestines were contracted to a rope, except the rectum and part of the colon, which contained an alcoholic injection. The pancreas, spleen and kidneys had not anything worthy of note. The bladder was filled with urine.

The muscles had a livid color; so had the blood. This fluid coagulated after escaping from the vessels.

We insert here two cases which occurred in Brookfield, Worcester County, although they are dated in 1816, after the disease had ceased to be considered epidemic. These cases, hitherto unpublished, were furnished us through the kindness of Dr. John Homans, of Boston, in whose practice they took place while he was a resident of Brookfield.

Case IV. On the fifteenth of April, 1816, M. S., a girl aged fourteen, large for that age, and in all respects enjoying good health, complained of headache, about 4 o'clock, P.M., which increased so she was compelled to take her bed at 7 o'clock.

She was restless and could not sleep, and notwithstanding the application of remedies, such as mustard plasters to the back of the neck, mustard baths to the feet, cold water to the forehead, &c. &c., she got no sleep. At 4, A.M., I saw her. The skin was cold and a profuse perspiration had commenced an hour previous; the eyelids were drooping. The surface of the whole person was covered with petechiæ, the spots being large as a quarter of an inch in diameter—on the face and neck varying in size to a mere point; and on the body and extremities much smaller than on the face. Color did not disappear on pressure. Pain in head and back of neck intense, mind confused, pulse 100, weak and irregular. At 6, lost power of speech, and died about 8, A.M. There was no convulsion, but slight opisthotonos. The above case occurred in the town of Brookfield; house situated on a slight elevation, a meadow lying on the southwest, and west of it. The family were in easy circumstances, and enjoying good health.

Case V. On the fifth of May following, visited Miss C. A., aged 19, who had been in good health (though never robust) until the day previous, when she complained suddenly of headache, when at a short distance from home—so intense as to compel her to return. The pain I believe, in this case, was more severe in the back of the head, and upper part of the spine. In the after part of the day, she had nausea, faintness, pulse between 70 and 100, and feeble. Petechiæ commenced appearing in the evening, not so large or so numerous as in the other case, but, as in that, of a

deeper hue, and larger size on the face, than elsewhere; slight delirium followed, and her mind continued confused. Occasionally a slight convulsion occurred, and, as in the first case, slight opisthotonos, until death took place at the end of about 30 hours from the onset of the disease.

The locality in which the house stood was healthy, neither low nor much elevated, but sufficiently high not to allow water to remain stagnant. The father was a wealthy farmer.

No examination was allowed in either case.

What was the disease we have been describing? Dr. Holmes declares (op. cit.) "it is easier to say what it was *not* than what it was." He then goes on to say it was not scarlatina or angina maligna, as some supposed, else the character of the complaint would have been obvious in the mild cases, at least, of which there were great numbers. It was not pneumonia typhöides, he further remarks, because, according to the report of the Committee of the Massachusetts Medical Society, the structure of the lungs is not commonly deranged. Dr. Hale, speaking of the spotted fever of his day, *versus* typhoid fever then called typhus, says if "typhus" (typhoid) is to be considered a particular disease, the fever under consideration was not a "typhus," for it did not exhibit the characteristic symptoms which belong to that disease. It had not the regular approach, nor the uniformity of appearance of typhus. Its progress was more rapid, its features more variable, its changes more abrupt, and its termination more sudden. Dr. Holmes again (op. cit.) takes ground against the theory that spotted fever is a form of the British *Typhus*, in the following words: "A disease which was hardly suspected of being contagious, which was generally fatal in the first two days if at all, and was considered by experienced observers as free from danger if the patient survived the third day, in which the mortality varied from

one in two, or a still higher rate, to one in a hundred, and above all, which selected the villages of the interior for its ravages, and though it showed itself in the immediate neighborhood of the capital of New England, never attracted any notice, if it appeared at all, within its walls—such a disease presents too many points of difference when compared to British typhus to admit of being forced into the same category." Finally, while acknowledging the resemblance of the symptoms of the epidemic to those of the pernicious algid fever of malarious districts, he maintains that since "the disease did not present the intermittent or remittent character when its course was protracted, that the lesion of the spleen and the sequelæ of these diseases do not appear to have been present, that it prevailed at a season when they do not usually make their appearance," it is sufficiently proved that there is an essential difference between the spotted fever of 1806 to 1815, and the various forms of intermittents and remittents.

The Committee of 1810 came to the conclusion that their spotted fever was fever combined with internal inflammation, and that the inflammation was commonly erysipelatous; frequently of a character intermediate between erysipelatous and phlegmonous.

As erysipelas is an inflammation of an asthenic character, this definition is suggestive of the term used by Drs. Miner and Tully to designate the disease in question, viz.: Phrenitis Typhodes.

Dr. Tully, however, considered the spotted fever of his time to have appeared in some cases in the form of *typhoid pneumonia.* An epidemic of typhoid pneumonia, so much resembling the spotted fever as to be called by some a modification of that disease, prevailed in the Northern Division of the U. S. Army from 1812 to 1813, principally at Plattsburg, Burlington, Greenbush, and Buffalo. It was frequently fatal in twenty-

four hours, but more often the patient survived from four to six days.* Two other forms of the spotted fever were also recognized by Dr. Tully; so that he made in all four forms. viz.: *typhoid phrenitis, typhoid pneumonia, typhoid hepatitis,* and *typhoid enteritis.* Dr. Tully appears to have believed the typhoid inflammation in all these alleged phases of the spotted fever to be *the* disease, with no other lesion behind it in the chain of causation.

The epidemic we have been describing seems to have been lost sight of after the year 1815; and though Dr. Jackson has up to within two or three years met with a sporadic case now and then, spotted fever has till a short time since been known to most of the present generation of physicians only as a historical curiosity.

THE PRESENT EPIDEMIC.

Half a century having elapsed since the report of the Committee of 1810, and during the height of the devastating war, which has just closed, the attention of the profession is called to an epidemic different from any disease the observers had met with before, and attacking various and distant parts of the country. As in the old spotted fever there were, in many instances, petechiæ and other spots; like that epidemic, the disease was at first mistaken by some for scarlatina, an error which was soon laid aside; like that, it was thought to be assimilated to intermittents or remittents, while on

* Trans. Phys. Med. Society, New York, 1815 to 1817.

reflection it was readily seen that it occurred at a season of the year when miasmatic diseases do not prevail, and among persons who had not been exposed to malarial influences, or if exposed, less so than their companions who escaped the affection; and also, that it was not amenable to the treatment which usually controls periodic disorders; like the old spotted fever, it was considered by some as a form of the British typhus; by others denied such a classification; and for the same reasons that led the old spotted fever to be distinguished from typhus. By some, like the former epidemic, it was, and is, called "spotted fever," on account of certain cutaneous eruptions which show themselves in many cases. Others, seeing that these symptoms were not universal, and that cerebro-spinal symptoms were much more decidedly characteristic phenomena, while at the autopsies inflammatory or congestive appearances of the cerebro-spinal membranes were very generally found, gave it a name conformed to those symptoms and appearances, and corresponding somewhat to the pathology adopted by the Committee of 1810, as well as to that of Drs. Miner and Tully in selecting the term "phrenitis typhodes," viz.: cerebro-spinal meningitis, or epidemic cerebro-spinal meningitis.

Symptoms and Post-mortem Appearances of the present Epidemic as compared with those of the Epidemic of 1806 to 1815.

One of the ablest papers published on the present epidemic, that which at an early period brought it prominently before the profession, was by Dr. J. B. Upham on "Congestive Fever (so called), or Epidemic Cerebro-spinal Meningitis as it occurred in the winter and spring of 1862–63 in the Camps in and around the town of Newbern" [North Carolina].

We proceed at once to give Dr. Upham's summary of the

symptoms and morbid appearances, as presenting an admirable picture of the disease. Side by side with the former we give the corresponding symptoms of the spotted fever of 1806–15, subsequently mentioning the differences between the two, in order that some idea may be formed whether or not the epidemic of to-day is the same disease as the old spotted fever.

The passages from Dr. Upham's paper which are italicized have no corresponding ones from other authors.

Dr. Upham's Summary of the Symptoms of "Epidemic Cerebro-spinal Meningitis," in 1862–63.	*Corresponding Statements relating to the Spotted Fever of* 1806–15.
I. "In its mode of attack the disease was commonly sudden and without premonition, the patient for the most part continuing on duty and making no complaints till the very day of his seizure. Some of the most violent cases thus commenced. Case XII. is in point, where the soldier appeared with his company at the evening dress parade, complained of chilliness, headache, &c., during the night, and was dead within thirty-six hours following.	I. "The invasion of the disease is generally sudden and violent. * * * The subject of it is seized in the midst of his usual labor or occupation, and oftentimes is struck down suddenly almost as by a stroke of lightning."—Mass. Medical Society's Report, 1810, p. 122 of "Medical Pamphlets" in Public Library of Boston.
II. And the subjects of the disease in most cases were those previously in the fulness of robust health.	II. "By some gentlemen it is remarked that females are more subject to the disease than males, and this was true in Worcester, the only town from which we have received a list of the sick. Yet one gentleman states that it attacks most especially the most healthy and robust, male and female."—

	Mass. Med. Society's Report, 1810, p. 136.
III. The symptoms were at the first headache, referred oftentimes to the back part of the head particularly.	III. The head is more frequently affected with pain than any other part; and when not affected at the first moment, it almost invariably becomes so in a short time.—Ibid. p. 122. Hale says "the head and back," p. 55. Williamson, quoted by North, says in some the pain was in the "back of the head, extending down the neck."
IV. With dizziness—	IV. Hale mentions dizziness frequently. "The most common mode of attack was by a violent pain in the head and dizziness."—P. 54.
V. Pain in the back and limbs, this last occasionally of an excruciating character.	V. "In the earlier part of the epidemic period, the disease always commenced with *severe pain* in some part of the body, which, if it did not begin there, soon extended to the head and back."—Hale, p. 55.—North, and M. M. Soc. Report say "excruciating" pain.
VI. With sometimes rigors.	VI. "This prostration is accompanied or followed by universal or partial chills."—M. M. Soc. Report, p. 124.
VII. Nausea and vomiting.	VII. "Frequently eructations, nausea and vomiting ensue."—Ibid. p. 124.
VIII. Chilliness rather than a well defined chill characterized the accession of the disease.	VIII. Among the symptoms in "the most common mode of attack," Hale reports "chilliness," p. 54. Again, p. 57, "At a later period of the season * * * there was

	frequently rather a universal coldness and inaction than a real chill."
IX. A peculiar stiffness in the muscles of the face and neck was often an early symptom.	IX. "A kind of clonic spasm of the muscles of the neck" is mentioned by North among the "more unusual symptoms."—P. 15.
X. This would be followed by local spasms,	X. "Convulsions and spasms occasionally attend the access of the disease; but they are more frequent in its later stages."—M. M. Soc. Report, p. 123.
XI. perversion of vision, &c.	XI. "The powers of sight are affected in various degrees, from a slight dimness to absolute blindness."—M. M. Soc. Report, p. 123. "Blindness in some, in others double or treble vision." —North, p. 15.
XII. In some cases the initiatory symptoms were those of a severe cold, with a disposition to paralysis of the tongue and a portion of the muscles of the face.	XII. "In the muscles of *various parts*, paralysis has been occasionally observed; as in those of one hand or foot, and oftentimes in those subservient to deglutition." M. M. Soc. Report, p. 123. "In some of Dr. Hale's cases it is mentioned that the tongue was protruded with difficulty." The symptoms enumerated as those of "the most common mode of attack," on page 54 of Dr. Hale's book, will pass for those of the severe cold.
XIII. With this the respiration would be difficult and irregular, giving occasion to fear a congestive attack of the lungs.	XIII. "The respiration was much and variously affected; in general it is difficult. Cough rarely occurs, and the difficulty of respiration has not commonly appeared

	to arise from an inflammation of the lungs."—M. M. Soc. Report.
XIV. *There was often tenderness at the nape of the neck and along the spine early in the disease.*	XIV. *Pain in the neck and back are mentioned by authors, but tenderness distinguished from pain is not.*
XV. The skin was usually moist, but hot.	XV. The old spotted fever was described as having three stages. In the first, Hale says, the skin was dry with a burning feeling.—P. 54. In the second stage it was warm, without that burning heat, and moist.—P. 68.
XVI. The face was suffused, often of a dusky hue, and the features distorted in the manner above mentioned—the eyes congested and suffused.	XVI. "The face and eyelids are often swollen; and in some cases the face is swollen and black like that of a person strangulated. The eyes" were "dull and glassy or red and watery." M. M. Soc. Report, p. 128. "Redness and effusion of the eyes," says North, p. 15. "Features dissolved, with a loss of all character and expression."—M. M. Soc. Report, p. 124.
XVII. There was not for the most part active delirium, but perversion of intelligence rather, and dulness and indifference to outward objects, *from which condition the patient could be roused and made to answer questions consciously.*	XVII. "The delirium is often mild; in some cases, however, * * * it produces a fury which is scarcely to be restrained."—Ibid. p. 123. The Report does not say whether the patient could usually be roused so as to give logical answers.
XVIII. The tongue had at the first, a white creamy coat, which in the course of the disease, became yellowish or brown at centre and base,	XVIII. "The tongue is usually moist and white through the whole disease, when it terminates within three or five days. When it con-

more rarely dry and cracked towards the close.	tinues longer the tongue becomes darker colored, yellow or brown. It is sometimes clear and red." —Ibid. p. 133.
XIX. There was loss of appetite,	XIX. "The appetite is diminished, but is not always so entirely destroyed as in most other acute diseases." —Ibid. p. 133.
XX. but usually not very urgent thirst.	XX. "There is seldom any remarkable thirst."—Ibid. p. 133.
XXI. The heart's action was irregular, sometimes tumultuous, to which the pulse did not always respond, being mostly accelerated but not strong, occasionally intermittent.	XXI. "Velocity of the blood increased, with a very sensible diminution of momentum in the radial, while in the carotid arteries it was much augmented." Danielson and Mann's Essay in Dr. North's book, p. 90. "The pulse like other symptoms was various, sometimes considerably full, but generally very weak, quick and irregular."—Dr. Woodward's remarks in the book of Dr. North, p. 113. "They [the pulses] are sometimes hard: more often they are intermittent, and irregular both in force and frequency; they are remarkably variable, so that in the course of an hour, and indeed in much less time, they change from quick to slow, from strong to feeble, and vice versa.—M. M. Soc. Report, p. 130.
XXII. The bowels were regular, or inclined to diarrhœa and costiveness by turns.	XXII. The bowels, some authorities say, were rather costive than loose. Dr. Hale says, "There were a

	few instances of diarrhœa in the commencement of the disease, and it sometimes made its appearance "later. There was much more often a tendency to costiveness than to diarrhœa."—P. 93. But on the whole, he says, "the bowels showed very slight marks of disease." Page 92.
XXIII. Petechiæ were not an unfrequent manifestation—in appearance almost identical with the true typhus eruption, and like that seen upon every part of the body *except the face*—persistent upon pressure, varying in hue from the darkest aspect of measles to that of the true petechial spots imbedded in the skin. Purpural spots, abundant and of large sizes, were sometimes present, and were always a grave symptom. [Other American observers have noticed besides petechiæ, efflorescences, ecchymoses, vibices. Also spots on the face.]	XXIII. The Committee of 1810 say the eruptions in their spotted fever were not constant, and varied from red spots to purpura, petechiæ, and vibices. An appearance like measles was sometimes noticed. They appeared on various parts of the body and limbs.—M. M. Soc. Report, pp. 135 and 136. Dr. Strong says they were also found *upon the face.* He also says they did not rise above the surface or recede upon pressure. (Dr. O. W. Holmes, op. cit.)
XXIV. There was no marked tenderness of the epigastrium or abdomen.	XXIV. "The bowels showed but very slight marks of disease."—Hale, p. 92.
XXV. In the cases of longer duration there was in the last stages *sordes on the teeth and lips,*	XXV. Sordes not mentioned. "When the disease continues longer, the tongue becomes darker colored, yellow or brown."—M. M. Soc. Report, p. 133.
XXVI. and involuntary evacuations of urine and fæces.	XXVI. In the comatose stage, says Hale, "the urine and fæces were passed involuntarily."—P. 75.

XXVII. *The patients often die without much symptoms of exhaustion.* [In several of Dr. Upham's cases it is mentioned that the patients died without great exhaustion. Yet in cases V., VI., XI., use is made of the following expressions, viz.: "exhausted," "exhaustion almost amounting to collapse," "collapsed." The prostration in other reported cases is as excessive as in any of the epidemic of 1806–15. At any rate, all observers will concur in pronouncing the present epidemic one of decidedly adynamic character.]	XXVII. "In whatever form the disease commences, there suddenly ensues great prostration of strength. In some instances the patient is described as almost immediately falling down under the weight of the disease."—M. M. Soc. Report.
XXVIII. *The decubitus was mainly on the side,*	XXVIII. No mention of decubitus found. In speaking of the pain, the Committee of 1810 say it is often confined to one side of the body, and the left side is more apt to be affected than the right.
XXIX. with the head not unfrequently thrown back, the neck rigid and stiff, a partial opisthotonos.	XXIX. The Committee of 1810 speak of spasms "occasioning the head to be drawn back as in opisthotonos." P. 129. Other instances of occasional mention of this symptom have been cited above. But we should infer that it was much less frequently noticed in the old spotted fever.
XXX. There was uniformly great restlessness and jactitation.	XXX. "Restlessness and agitation."—M. M. Soc. Report, p. 124.
XXXI. As an accompaniment, and occasionally a	XXXI. Inflammation of the eyes I have found mention-

sequel to the disease, iritis was several times observed.

ed, but without always discrimation as to the part of the organ affected.

XXXII. So also was synovitis.

XXXII. Analogous if not similar to this are the following statements. "In some cases swellings have occurred on the joints and limbs. These have been very sore to the touch, and their appearance has been compared to that of the gout."—M. M. Soc. Rep., p. 135. North says, "swelling like rheumatism of the joints."—P. 15.

XXXIII. And in one instance pericarditis.

XXXIII. "Occasionally inflammation is also found on the membrane covering the heart, and lining the pericardium."—P. 160, M. M. Soc. Report.

XXXIII. The above are among the more prominent and constant symptoms, but there was a considerable diversity in the manifestation of the disease during its progress, whether towards a favorable or fatal result; in no one case do I remember to have seen even a majority of those I have enumerated present.

XXXIII. "Every symptom is not to be observed in every case; on the contrary there is great variety in the symptoms, and it is said there is great variety also in the order in which they occur." P. 127, M. M. Soc. Report.

XXXIV. The duration of the affection varied from a period of less than thirty-six hours, to that of three, four, or six weeks, and even longer."

XXXIV. "A few are taken off suddenly in ten or twelve hours; others in twenty-four, thirty-six, or forty-eight hours, from the first symptom of the disorder."

"By some of our correspondents it is said that recovery from this disease has been rapid and the subsequent state of the health as

good as usual. But the exceptions to these remarks are certainly numerous."—Pp. 126 and 135, M. M. Soc. Report.

Of the fatal cases (which were of relapse) in Hale's practice, three were prolonged to the thirteenth, sixteenth, and twenty-second days respectively. The cases of recovery he rarely attended longer than fourteen days. But the number of the sick and the distance between them, compelled him to leave them early in the convalescence.

An anomalous symptom described sometimes as marking the invasion of the old spotted fever, we are not cognizant of as occurring in our present epidemic, viz.: the access by a sudden pain in a joint, in a finger or toe, or a sensation like the stinging of a bee, &c., heretofore mentioned.* But the most important difference between the epidemic of 1806–15, and that of to-day, seems to be that opisthotonos does not appear to have attracted the attention of the older observers as a frequent and striking phenomenon. This difference will probably not be considered fatal to the identity of the two epidemics, since, at most, it shows only that the *spinal* did not share the affection of the cerebral meninges in the older one, and does not, it is fair to presume, prove a difference in its essential nature from that now prevailing.

Relapses occurred in 1806–15; and though Dr. Upham does not mention them, there have been many instances of them in the present epidemic.

* Stinging pains in the arms and legs have been lately reported, but not as the first symptoms.

We now quote Dr. Upham's summary of the *anatomical lesions*, which we think corresponds remarkably with that we have previously given, as compiled from the report of the Committee of 1810, even to the thoracic and abdominal complications.

"The *anatomical lesions* in the cases examined were confined principally to the brain and spinal cord. When death took place early, within two or three days, there was commonly opalescence of the upper surface of the cerebrum, seemingly in the subarachnoid fluid; an increased vascularity of the membranes of the brain and spinal cord, affecting the pia mater especially; a large increase of serum in the subarachnoid space and ventricles, clear or turbid, and mixed with flocculi of lymph, with, as often as otherwise, even in cases of the briefest duration, an abundant exudation of thick, yellowish, apparently semi-organized lymph on the base of the brain and medulla oblongata. Conjoined with these phenomena, there was, in such cases, more or less passive congestion of the lungs; increase of the pericardial fluid, and occasional engorgement and enlargement of the liver and spleen."

Correspondence between the foregoing and "Epidemic Cerebro-spinal Meningitis" as observed in France.

We cannot forbear to translate, here, from Valleix's *Guide du Medecin Praticien* (Vol. IV. pp. 540, 541), the greater part of his graphic description of the morbid appearances in what he denominates "*méningite cérébro-spinale épidémique.*" We would premise that his statement of the symptoms corresponds so completely with those of our present epidemic of spotted fever or cerebro-spinal meningitis, as (taken together with the *post-mortem* appearances) to leave no doubt that we, in this country, are now at least dealing with a dis-

ease which has been observed in different parts of France for upwards of twenty-six years, and which has been most thoroughly described by Valleix under the name of epidemic cerebro-spinal meningitis.

"The anatomical lesions," says Valleix, "in this grave malady, have, as would be expected, been studied with the greatest care. The principal lesions have been found in the pia mater of the brain and spinal cord. Yet, all observers have reported a certain number of cases in which these lesions were very slight or inappreciable. Thus in some subjects there were found in the cerebro-spinal membranes nothing but injection more or less intense, a little limpid serosity, or, on the other hand, marked dryness without injection, but all these cases were from among those in which the meningitis had struck down the patient as by a thunderbolt, and in which by consequence the pathological alterations had not had time to develop. In other cases there were found in the meshes of the pia mater either a liquid which was yellowish (or yellow) and turbid; or thick perfectly well marked pus; or else a denser substance, of a pseudo-membranous appearance, opaque, yellowish, dense, of a thickness of 3 to 6 millimetres, and similar, according to an expression of M. Tourdes, to a layer of butter spread over the surface of the brain.* It is especially along the course of the vessels that this morbid production shows itself, and in fact, so long as it is in small quantity, it can only exist at these points and ramify with the veins. At other times there are seen here and there flat and otherwise uneven masses, of variable size, and composed of the same substance. Finally, this morbid product has been seen so abundant that it entirely enveloped the cerebrum and cerebellum. Ordinarily, neither do this layer nor the purulent

* See the summary above given of the morbid appearances in the epidemic of 1806–15.

masses show themselves except on the surface; but sometimes they penetrate with the pia mater even into the depths of the convolutions. Pus is not found in the cerebral ventricles save in a limited number of cases (half, according to the researches of M. Tourdes): sometimes these cavities contain only limpid serosity. Purulent infiltration of the choroid plexus, and superficial softening of the walls of the ventricles have also been seen, but these lesions are only of secondary importance.

"All points of the cerebellum and cerebrum are liable to these alterations: but they have been found almost constantly on the cerebellum, frequently at the summit and base of the cerebrum, more rarely on the pons Varolii, &c.

"In the spinal canal the lesions are similar and occupy likewise the pia mater. * * * * In the brain and spinal marrow injection and partial softenings are found. But, although a few symptoms observed in certain cases are referable to these lesions, the latter are only accidental in the disease under consideration, which is perfectly characterized by those we have just described.

"The alimentary canal has presented a few traces of slight inflammation in quite a number of cases; but never alterations of Peyer's patches, which have been found merely a little prominent. Brunner's glands are frequently enlarged through a great extent of intestine, but never ulcerated.

"The lesions found in the other organs need not delay us here, since they are rare and variable, and are considered only the result of complications. Suffice it to say, that there have been noticed inflammation of the *lungs*, of the *pleuræ*, of the *joints*, &c."

HISTORICAL NOTICE OF THE DISEASE.

We have now compared the symptoms and anatomical lesions of the spotted fever of 1806–15 with those of the "spotted fever," otherwise called "cerebro-spinal meningitis" at present prevailing. We have also assumed to identify our epidemic with a disease which has been observed abroad, and there described under various names, among the most prominent of which is "epidemic cerebro-spinal meningitis." It is therefore in order in this place to say the few words remaining to be said of the history of the disease, before proceeding to the special work of collating its statistics for Massachusetts.

Discussions may be found in the works of various writers as to whether or not the disease under consideration be the same with certain epidemics described by the older nosologists. Into these discussions we do not propose to enter; we will merely mention that a French writer, M. Tourdes, has examined the question, and going back to the earliest period of medical history, has passed in review the different epidemics capable of being assimilated to cerebro-spinal meningitis. Valleix, in criticizing the narrative of M. Tourdes, remarks that it contains a number of facts which, without much forcing, might be considered as examples of epidemics of cerebro-spinal meningitis similar to those which have come under the eyes of observers in our day; but that it adduces other facts which cannot be so regarded, and can only be looked upon as epidemics of typhoid or typhus fever. He adds that in all these cases there is too great incompleteness of description, and deficiency of anatomical

investigation, to enable us to accord much importance to these historical researches.

The disease in question, denominated by the Italians, it is said, "*tifo apoplettico tetanico*," is sometimes described in Germany as "cerebral typhus." Among the Germans it is also popularly known as "*flecken fieber*," which means literally "spotted fever"; and again, on account of the painful contractions of the muscles of the neck, as "*genick-krampf*." Its usual scientific denomination in Germany is cerebro-spinal meningitis.

It is stated to have been first clearly recognized, at least in later times, at Geneva in 1805 (about the same epoch at which it broke out in New England); afterwards in different localities on the Continent, in 1806–7, 1811, 1813, 1814, 1815, 1816, and 1823.—(American Journ. Med. Sciences, July, 1864, p. 93.)

Valleix * states that "epidemic cerebro-spinal meningitis" invaded France some little time before the year 1839, showing itself first at Bayonne, Narbonne, Foix, Bordeaux. In 1839 it reigned at Rochefort, and almost exclusively in the prison for galley slaves, being taken there, at first, for typhus, but afterwards recognized as "epidemic cerebro-spinal meningitis." Later it raged in localities very diverse. A little while before the advent of the cholera in 1849, there were epidemics at Orleans, and Paris. In France the epidemics have shown themselves almost exclusively among soldiers (and those principally new recruits), which amounts to saying that its subjects were there mostly adults of the male sex, and from twenty to thirty years of age. At Rochefort, however, the affection attacked in the prison ("Bagne") principally middle aged prisoners, while in the town it raged mostly among individuals of less than twenty years of age,

* Guide du Medecin Praticien, Vol. IV., p. 529.

almost exclusively males. Valleix could not discover that either climate or season had any special influence upon the malady.

In Leipzig there were cases of the disease in July, 1864, followed by more in September and August. Prof. Wunderlich states that he had not heard of the malady in Germany before that time since 1849.

In Ireland, Dr. Darby, of Bray, first called the attention of the profession to the disease, having observed it in the Rathdown Union Workhouse, during the months of January, February and March, 1846. It appeared in the South Dublin Union Workhouse about the same time; and in the Belfast Workhouse in April and May of the same year, thus declaring itself in three different localities in Ireland, where it was described by Dr. Robert Mayne, in the Dublin Quarterly Journal of Medical Science for August, 1846, under the name of "cerebro-spinal arachnitis." Dr. Mayne says, "Its pathology seems to have been nearly uniformly the same, wherever examined. The serous membrane covering the brain and spinal marrow has been found *invariably* the seat of extensive inflammation; and unlike the more ordinary forms of arachnitis, the *spinal* arachnoid suffers much more severely than the *cerebral*." For the rest, the anatomical lesions corresponded with those given above from Valleix, Dr. Upham, and our Committee of 1810. The invasion of the disease was in most instances sudden. The Irish cases were generally fatal—some in 48 hours, most of them about the fourth day, while a few lasted a fortnight or three weeks. No mention is made in Dr. Mayne's report of petechiæ or other spots. The above cases were nearly all of *boys under twelve years of age.*

As we have said, the paper of Dr. Upham, published in 1863, in the Boston Medical and Surgical Journal, in the number for April 9th et seq., was one of the first to draw

the attention of the profession to the prevalence in this country of the present epidemic. But Dr. Gerhard, in an article presented to the College of Physicians of Philadelphia, April 1st, 1863, and printed in the American Journal of Medical Sciences for the following July, formally introduces the subject to the medical public with a notice of recent cases of which he had been cognizant, in and around Philadelphia, where, says Dr. Gerhard, the disease was at that time entirely novel. Since then many cases have been reported in that place. Dr. Gerhard states the subjects, of whom he was cognizant, to have been mostly from 15 to 25 years of age, and that more *females* were affected than males.

The evidence, however, of subsequent reporters, brings to light the occasional occurrence of the disease (since the epidemic of 1806–15) in diverse places in this country during a period of a score of years previous. For instance, Dr. Drake says it was first noticed in the "Interior Valley of North America" about the same time it attracted attention on the Continent of Europe, that is, in the year 1840–41.

In 1842 there was an epidemic of it in Rutherford County, Tennessee.

At a meeting of the College of Physicians of Philadelphia, April 6th, 1864, Dr. Gilbert stated that he saw at Gettysburg, "in 1844, or thereabouts," two cases, in both of which there was sudden attack by chill, great prostration of the vital powers, with "cerebro-spinal complication," stupor, coma, and death; the first case in twelve, the second in sixty hours. Another case was seen by Dr. Gilbert in Philadelphia, in 1846, in the person of an adult male who died in ten hours after the attack. Of the autopsy made in this case, Dr. Gilbert very briefly says, that the most remarkable condition discovered was a spotted appearance of all the serous surfaces of the chest and abdomen, no statement being made as to whether or not the head was opened.

In the autumn of 1845, and the following winter, it was at Mt. Vernon and other places in Southern Illinois.

From January to March, 1847, it was in Vicksburg, Mississippi.

In February, and the spring of 1847, it occupied Bentonville and Union City, Arkansas.

In January and February, 1847, a regiment of United States recruits from Mississippi, while in the vicinity of New Orleans, suffered severely from it.

In February, 1850, it prevailed in New Orleans.

In the winter and spring of 1848, the disease prevailed in Montgomery, Alabama, under the name of "epidemic meningitis."

At the last mentioned place the *post-mortem* appearances described were similar to those of the Committee of 1810, except that in the cases at Montgomery the spinal meninges were found to be affected. Dr. Ames reports that there were in Montgomery 250 cases out of a population of 4,000, or 6¼ per cent. Of 85 cases described, there were 22 whites and 63 blacks, the black population out-numbering the white. Of the whites attacked there were 10 males and 12 females; of the blacks, 36 males and 27 females. Dr. Ames gives the following table: —

Ages.	Whites.	Blacks.
Up to 6 years,	1	1
" 10 "	2	6
" 21 "	8	15
" 31 "	3	24
" 41 "	3	10
" 51 "	2	5
Above 50 "	3	2
	22	63

At the South, says Drake (On the diseases of the Interior Valley of North America), the affection attacked town and

country, but not the larger cities, with the exception of New Orleans. The subjects were mostly children and young persons, but no age was exempt.

At a meeting of the Boston Society for Medical Improvement in 1849, Dr. Joseph Sargent, of Worcester, Mass., reported several cases of "cerebro-spinal meningitis," as he termed them, having the characteristic symptoms and anatomical appearances of the disease we are discussing. Those cases were instances of an *endemic*,* which prevailed in the towns of Millbury and Sutton (adjoining each other in the central part of Massachusetts), during the month of March, 1849. Perhaps Dr. Stillé refers in part to these cases when he says the disease appeared in Massachusetts and New York in 1850 to 1851.

According to Dr. Stillé the *present epidemic* took its rise in the central and western parts of New York (where it prevailed extensively), in the year 1857, and thence travelled southward at least as far as North Carolina. This statement needs to be modified, we find, in two points. The disease broke out in April of the same year, 1857, in the town of Becket, in Berkshire County, Massachusetts. Thus, it can hardly be said to have taken its origin in New York. Again, it has been heard from not only at the South, but in other directions—North, East, and West. If all the facts were known, perhaps Dr. Stillé's statement would have to be still further modified. For example, are we sure that the first cases have even yet been reported? From our experience in this State, showing the small number of cases which have been published in comparison with that which has come to light upon investigation, we infer that the information before the public of the epidemic at large, is very partial and imperfect. The following facts, however, illus-

* The word *endemic* is used here in the sense of a limited epidemic.

trative of its progress and behavior, we have culled for record here.

In the year 1858, cases were reported by Dr. Craig, to have occurred at Churchill, N. Y. In six of these cases, autopsies were made, at all of which were found inflammatory lesions of the meninges.

In the winter of 1861–62, there was an epidemic of the disease in Livingston County, Missouri, breaking out first among the soldiers in Chillicothe.

We find that in the fall and winter of 1863–64, it prevailed among the negroes in Memphis, Tennessee, mostly in subjects from 10 to 14 years of age, of both sexes; though many adults were attacked, and some very old negroes. The first winter, Dr. Morrill, the reporter, heard of no case of recovery. It occurred among the negroes in Maryland, in 1864.

It has extended its ravages, as we have said, in other directions. In the winter and spring of 1863, it raged extensively and very fatally in Northern Indiana. In Cambridge, Ohio, it prevailed to an alarming extent in 1863. Cases are also reported in Newark, Ohio, from Nov. 30, 1863, to January, 1864; and at Mechanicsburg, Ohio, in February and March, 1865.

At the anniversary meeting of the Illinois State Medical Society, in 1864, Dr. McVey read an account of its prevalence in Morgan County, Illinois, in 1863–64. On the same occasion, Dr. J. Adams Allen read an excellent paper on an epidemic of it prevailing, as he says, for some years previous, throughout Illinois, "and many of the North-western States."

In the months of January, February, March and April, 1863, there were seven cases among the midshipmen billeted on the school-ship in the harbor of Newport, Rhode Island. In the early months of the year 1864, it prevailed at Brat-

tleboro', Vermont, in the military camp; also in the village, and in isolated farm-houses for some miles around.

It will be our duty to report on its incursions in this State in another part of this paper.

It may be interesting to note that the Surgeon of the Flag-ship, "The Blackhawk," of the Mississippi Squadron, reports a case on his vessel in May, 1864, in a newly enlisted man, the only case in the Squadron. In this case the meningeal lesions were very marked on *post-mortem* examination.

Still more interesting, it seems to us, is the following fact. In the April number of the American Journal of Medical Sciences for 1865, Dr. Burns reports, among a number of cases of recovery in Philadelphia in the spring of 1864, two cases of what he claims to have been instances of the disease in question during pregnancy, thus repeating the experience of observers of the epidemic of 1806–15. Both patients were at the sixth month of gestation, and went their full time. One of the infants died of diarrhœa, in four months after its birth, the other in ten months, of "pulmonary catarrh."

Cases have been reported, in which sore throat was an early symptom; corresponding, like the cases just mentioned, with the observation of one of the reporters of the old spotted fever.

In relation to the prevalence of the disease in military camps and barracks, the writer addressed a letter to the Surgeon General of the United States, and received through Assistant Surgeon General Woodward a prompt and very kind reply, from which we give the following extract: "I am directed by the Surgeon General to say in reply to your communication of the 8th inst., that spotted fever, otherwise termed cerebro-spinal meningitis, has prevailed to a considerable extent among the troops in camps and barracks during the present war. Recruits have not escaped, and those have

especially suffered who were crowded in barracks and draft rendezvous." The records of the Surgeon General's office are not sufficiently made up to furnish a report of the comparative number of military establishments invaded by the disease, or of the proportion of recruits attacked by it. But these points will probably be published in official documents.

CONCLUSIONS FROM THE PRECEDING SKETCH.

To trace the course of the "spotted fever" in all its ramifications, even in this country alone, would be an arduous, if not an impossible undertaking, and is not our province. But, from the very brief sketch we have given, certain lessons may be derived, as follows, viz.:

I. The medical history of the Rebel States has been, during the war, to a great extent a sealed letter to us. But the writer remembers to have read, in 1864, a newspaper account of "a new disease" in one of the Gulf States, with a brief but very graphic summary of the symptoms, which tallies in most respects remarkably with those now familiar to us as symptoms of spotted fever, or cerebro-spinal meningitis. Of the large portion of the country, however, within our reach, North, East, and West, no extensive region seems to have been exempt.

II. From the fact mentioned by Dr. Jackson, that he had met with cases occasionally since the epidemic of 1806 to '15, and from the cases cited by Dr. Gilbert—two at Gettysburg, about 1844, and one at Philadelphia, in 1846—we perceive that there have been *sporadic* cases.

Endemics of the disease we have spoken of, as that of Dr. Joseph Sargent, in 1849, in this State; that of Dr. Ames, at Montgomery, Alabama, in 1848; and others.

Finally, we say the disease has prevailed as an *epidemic*, since 1857. Thus, the disease in question has prevailed sporadically, endemically, and epidemically.

III. Is this a *military disease?* In France, it has been declared so, since it there confined itself mostly to soldiers, among them particularly affecting new recruits. But, in Ireland, the reports given of it were from work-houses. In this country, military camps and barracks have often furnished the conditions requisite to invite its presence, since we are told by the Surgeon General it has prevailed in them "to a considerable extent." Its invasion of the regiment of United States recruits in Mississippi, in 1847, three years before it appeared in New Orleans, and ten years before it is supposed to have become epidemic, is an interesting fact. But while it is well known that many military establishments have escaped its incursions, private dwellings have, to a large extent, been visited with its baleful influence. Its course in the town of Brattleboro', Vermont, in 1864, may be taken as an epitome of its general behavior. It invaded the military camp for recruits on the outskirts of the town. There, the writer was told by Surgeon General Phelps, the chief medical officer in charge, that the opisthotonos was observed in a very intense form, the body of the patient being bent almost into the form of a semicircle. About the same time, it appeared in the village and in the distant farm-houses. A boarding school for boys, at the extremity of the village opposite to that where the camp was located, was represented by a single case.

Spotted fever, then, is clearly not exclusively, or *par excellence*, a *military* disease. To what proportionate extent military establishments, and particularly recruits are liable to it, remains to be ascertained.

IV. That the disease is *not* one of large cities, comparatively, is the general result thus far.

V. In France it is stated that neither *climate* nor *season* has been found to exert any influence upon the disease. In Leipzig, an epidemic described was in the summer. But in Ireland and this country, by far the greater number of cases hitherto reported have been in the first five months of the year.

VI. The evidence from all sources has been very generally in favor of the *non-contagiousness* of the disease. Facts strongly in point, are the single case in the boarding-school at Brattleboro', Vt., and the single case in the Mississippi Squadron.

VII. As to its choice of *sex*, the disease has shown great variation in different places. In the Irish work-houses it confined itself almost entirely to boys. In this country it has shown a preference in some places for the male sex, while in others more females than males have been attacked.

VIII. The *black* race in this country have not escaped the disease.

IX. In different sets of cases there is wide variation in the character of the *spots*, and the frequency of their occurrence.

X. The *fatality* of the disease has varied greatly in the different reports of the disease which have been given; e. g., the first winter of its visitation of Memphis, all the cases were fatal, while at Newport, 3 out of 7 recovered. We will remark here, that in the present epidemic, as in the old spotted fever, it has been noticed that those cases which proved fatal were generally so in a few days, or hours.

XI. The fact has been stated of the epidemic of 1806 to '15, that relapses sometimes occurred. They have also taken place in the present one. But, in the latter, unlike what obtained in the former epidemic, the instances of which we are cognizant have been often fatal.

XII. The present epidemic tallies with the old one in that cases of recovery from the disease *during pregnancy* have been related.

XIII. Finally, to sum up, the disease has shown great apparent capriciousness in its predilection for, or avoidance of military establishments; in its choice of sex; in the varying frequency of the occurrence of spots; in the character of the spots (we may add also by parenthesis, in the groups of its symptoms present in different individuals); in fatality; in liability to relapse.

It has been generally *consistent with itself* in the matter of contagion; and in prevalence in towns and the country rather than, or quite as much as, in large cities. It has shown, also, a frequent if not general preference for the earlier period of life.

Autopsies, in this disease, have not been numerous. Of those reported, almost all have given appearances within the cranium similar to some or other of those described above by Dr. Upham and others.

Exceptions, however, are alleged, upon which are founded by some the theory that the essential pathology of the disease is not in the meningeal inflammation. Thus Dr. Levick, in the July number of the American Journal of Medical Sciences for 1864, p. 136, gives the following instance.

Case VI. [The] little patient, eighteen months old, was perfectly well on retiring to rest on the previous night. At one o'clock she awoke and complained bitterly of her head. At 9, A.M., she presented the following appearance: The skin uniformly and finely mottled, of a purple hue, with here and there a few isolated spots of a deeper purple. Eyes slightly ecchymosed, presenting a dull, stupid, and at times an astonished appearance; pulse 60. Carbonate of

ammonia given, and the hot bath and turpentine used externally. Child died at 3, P.M., same day. The autopsy was most carefully made at 4, P.M., next day, by Dr. Packard, in the presence of Dr. Fricke, Mr. J. C. Warren and myself, and presented the appearances enumerated below.

EXTERIOR.

Decomposition of the walls of the abdomen, which are of a green color. The surface of the body universally mottled; vibices on the knees, petechiæ on the legs.

HEAD.

On removing the calvaria, a large ecchymosis was found under the pericranium near the sagittal suture. The vessels of the dura mater were filled with dark fluid blood, which could readily be pushed aside by the handle of the scalpel. The substance of the brain and of the medulla oblongata was natural in its appearance and consistence. There was no effusion in the ventricles, and the most careful examination failed to detect the slightest evidence of inflammatory exudation.

ABDOMEN.

Blood fluid in the mesenteric veins. The intestines were everywhere dotted with minute extravasations of blood, both on their outer and inner surface. Similar ecchymoses were found on the bladder, in the kidneys, and on the diaphragm. *Spleen* healthy, the Malpighian bodies prominent. *Mesenteric* glands enlarged; the solitary glands largely developed; Peyer's glands unaffected.

THORAX.

Ecchymoses on the diaphragmatic pleura. The lungs contained large quantities of fluid blood. The left ventricle of the heart contained two soft coagula, about the size each of

a pea. In the right heart, the blood was thin and fluid, looking not unlike claret wine. There were no coagula in the right side.

CASE VII. Dr. Levick, also, in the American Journal of Medical Sciences for July, 1865, reported a case which died in twelve hours. The patient, a woman, was covered with spots. There was no pain in the head, no opisthotonos. At the autopsy, the meningeal vessels were filled with black blood. *There were no traces of inflammation in the brain or its membranes.* The liver was congested and fatty. There were blood stains on the pleuræ, stomach, intestines, pancreas, uterus. In the ovaries were several vesicles filled with black blood. A few spots were seen on the bladder, many on and in the kidneys.

It will be noticed that in the accounts of the autopsies in these cases, though it is said there were no traces of inflammation, yet it is not specified whether or not there were *opalescence*, or preternatural *dryness* of the meninges. We shall refer to this point again.

TREATMENT.

As to the various modes of treatment tried in this novel affection, there is very little satisfactory to be said. In the British practice, bleeding and mercury were resorted to. In France, also, as mentioned by Valleix, bleeding was among the remedies employed. Venesection has been tried there to a great extent, and with results less satisfactory to the criticism of M. Valleix than to some of those who have used

it. Cold applications to the head have rather disappointed the expectations which have been formed of them. Results have not been in favor of mercurials. Blisters have been much used, but no evident advantage was derived from them; on the contrary, they often augmented the suffering of the patient, without ameliorating any symptom. Sulphate of quinine was tried also, but given for the purpose of conquering the affection itself; it had no real success. Administered during convalescence, however, with a view of rousing the appetite and hastening the recovery of strength, it was found to be of considerable utility.

Some practitioners in this country have thought that benefit was derived from quinine in their hands; but Dr. Upham's observation of it at Newbern, was, like that of Valleix, unfavorable.

One remedy alone Valleix feels authorized specially to recommend, and that is one which practitioners have been timid in using in cerebral inflammation, viz., opium. He says opium in large doses is the only remedy which has been administered with any confidence, and which appeared to exert any real influence over the disease. The dose of this drug which has been employed with apparent success, is *two or three decigrammes and sometimes more,* in twenty-four hours; the decigramme being equal to 1.544 grains Troy weight.

Dr. Atlee tried opium at St. Vincent's Home in Philadelphia, an institution for young children, the patients varying from two to four years of age; the usual dose for them being one-twelfth of a grain of the extract. Of nine patients at the Home, four recovered and five died. One of them was a Sister of Charity in attendance. She recovered. The dose for her was one-fourth of a grain of the extract of opium every three hours. The results here were on too small a scale, of course, to be decisive.

In the epidemic of 1806–15, also, opium was used by some practitioners who claimed for it much success.

Inhalation of ether was tried in France, with apparent benefit, as a sedative.

Bleeding has been tried in this country, in the present epidemic, but not, we believe, with very encouraging results. Among other remedies, quinine, already mentioned, ergot, permanganate of potash and hydriodate of potassa, have been reported. There is a general tendency toward a supporting and moderately stimulating treatment.

SPOTTED FEVER, OR CEREBRO-SPINAL MENINGITIS IN MASSACHUSETTS SINCE 1815.

Sporadic Cases.

That *sporadic* cases have occurred in Massachusetts has been already mentioned, Dr. Jackson having seen such occasionally since the epidemic which terminated in 1815. Perhaps, also, the two cases given in the account of the old spotted fever, which occurred in Brookfield, in 1816, should be classified under this heading.

The Endemic in Millbury and Sutton, in 1849.

We have already alluded to an *endemic* (as we call it) in this State, reported by Dr. Joseph Sargent, of Worcester. It attacked the towns of Millbury and Sutton, in Worcester County, in March, 1849. Millbury adjoins Worcester on the South-east, and Sutton forms the South-eastern border of Millbury. Of the first sixteen cases within a circuit of four

miles of a country not very thickly settled, there was no recovery that could be "relied on." Of twelve others subsequently reported to Dr. Sargent, by Dr. Rawson, only the first two died. Dr. Rawson, strange to say, depended mostly on bleeding and purging—not hesitating to bleed even in the cold stage. Death occurred in one instance of the first sixteen cases, in six hours from the attack: in three cases, within twenty-five hours; and in most cases, within four days.

In Millbury all were males but one, in Sutton there were three females at least; thus making four females or upwards out of the sixteen cases. In Millbury the disease was, for the most part, within a few rods of the Blackstone river. In Sutton, the cases were in various parts of the town, high and low. The Blackstone river skirts the town of Sutton on the North-east. In each of the two towns is a large pond or lake.

We here give, from the Records of the Boston Society for Medical Improvement, the following abstracts of those of Dr. Sargent's cases in which autopsies were made. We quote the reports of the autopsies in full.

Case VIII. E. L., aged 55, scythe maker in Millbury. Went to his work well at 7, A.M., March 26th, 1849, and returned at 8, A.M., complaining of "aching in his bones." There was headache during day, becoming worse in afternoon. Passed the night in a comfortable quiet sleep. Awoke at 7 o'clock, on the 27th, with a very severe headache, soon becoming intense. Had a chill at 10½, A.M. Pulse 85, apparently full, but easily compressed. Respiration not labored or hurried. Skin universally flushed, hot, dry; greatest heat about head. Pupils equal, moderately dilated, contracting to light. The patient seemed to be partially conscious. Being asked to put out his tongue,

would protrude it, and not retract it. Did not seem to be conscious of any pain—mistook morning for evening, and repeated the mistake when corrected. His tongue was dry, glossy, very red. At 1, P.M., a purgative having acted, the skin was universally pale, and cold, especially at extremities. Pupils contracted—obedient to light. The patient seemed entirely insensible to what was going on, talked incoherently, blowing the bellows, fishing, &c. Pulse 100, very small. At 5, P.M., was in great and almost constant jactitation—no rigidity. Died at 2, A.M., sixty-six hours after the probable invasion of the disease.

The treatment was by purgatives; calomel, with Dover's powder, and counter-irritation.

Post-mortem Examination thirty hours after Death.

The body was mottled by large ecchymoses. Two to three inches of adipose substance over abdomen, and nearly as much over thorax. Viscera of thorax and abdomen, examined carefully, present no abnormal appearance. Lungs healthy and crepitating, valves of heart normal; spleen small, liver and kidneys of usual size and appearance. All the abdominal organs inlaid in adipose substance; no elevation of Peyer's patches.

Upon opening the *cranium*, there was no unusual adhesion of the dura mater, which presented its ordinary appearance, and preserved its polish on the arachnoid side. Under the *cerebral arachnoid*, over the upper surface of both hemispheres, was seen a whitish deposit, as of purulent matter. On attempting to remove the arachnoid, the pia mater came with it, the two adhering so closely as not to admit of separation; and the purulent deposit was between them. On both sides of the cerebellum there was a considerable intermeningeal deposit of pus, and lymph also. The membranes having been detached from the *cerebrum*, it had not its usual white-

ness and polish, but was dull and punctated, like the inside of a strawberry, and, on being scraped, was found to be somewhat softened. The cut surface presented an unusual number of red points. The *cerebellum* seemed healthy; no unusual fluid in ventricles. No pus seen along *medulla oblongata.*

The spinal marrow being exposed from the front, at commencement of dorsal vertebræ, a considerable deposit of pus and lymph was found without softening of the marrow.

Case IX. A. G., æt. 47, farmer and teamster—usually a healthy man. Complained of "aching of the bones," March 3d, 1849, which was much increased on the 4th. Slept well on the night of the 4th, but woke early on the 5th, complaining of severe headache, backache, "aching all over." At 8 o'clock was found, by his medical attendant, lying on the side of the bed, his pupils much dilated, knowing nothing—with entire loss of muscular action, so that his hand if raised would drop. Pulse 80, and easily compressed. Head not very hot, general heat natural. Respiration not labored. He was lying like a man in a quiet sleep. Resisted in a dogged manner all medical and other interference. He was restless, getting up, walking about, and sitting down like a man with a stiff neck. Passed into a half conscious state, which he maintained, answering questions accurately for a moment, and then talking to himself or exclaiming with pain, till about the tenth day, when he sank into a typhoid state, with rigidity and opisthotonos. Then came subsultus tendinum, picking at the bed-clothes, and involuntary evacuations of urine. He died on the 13th day of his illness. The treatment was similar to that of the preceding case.

Post-mortem Examination.

The body was large, limbs rigid. On opening the head,

the veins of the meninges were found to be turgid, with dark blood. There was no unusual serous fluid below the arachnoid, but here and there, between the convolutions of the cerebrum, there was a whitish deposit, which, on the removal of the membranes, was found to be between the pia mater and the arachnoid, dipping down between the convolutions, and being of the consistence of lymph.

The membranes were easily detached from the cerebrum, leaving its surface white, polished, and of the ordinary firmness. It is rare to see the cerebral substance harder; the consistence was uniform; and the cut surface presented no unusual red points. The right lateral ventricle was distended with a serous fluid, containing flocculi of lymph and pus. The *choroid plexus* was red, like the comb of a cock. On removing the right hemisphere of the cerebrum from the skull, the anterior lobe presented an inter-meningeal deposit of pus and lymph, of an inch in irregular diameter immediately over the orbit. The sella turcica was covered in like manner, and the optic nerves enveloped—the nerves themselves preserving their ordinary consistence.

The right hemisphere having been removed, the deposit of pus and lymph dipping down between the convolutions on the other side, *in situ*, was quite remarkable. Neither tubercles, granulations nor ramolissement were found anywhere. At the base of the *cerebellum* and about the *medulla oblongata*, there was a good deal of lymph with abundant pus also; and this could be seen along down the *spinal marrow* as far as the eye could penetrate, all being bathed in pus. The *spinal marrow* was then exposed in front from upper dorsal vertebra to sacrum, and everywhere there was abundant pus between the pia mater and the arachnoid, especially on the posterior part, so that it could be spooned out. The spinal marrow itself and the nerves were quite firm. The right sciatic nerve, exposed by an incision through

the gluteal region, presented nothing abnormal. The lower lobe of the *right lung* was in a state of red hepatization—florid, solid, heavy, friable, containing no air. Lungs otherwise entirely healthy. Some subsidence posteriorly.

Spleen small; pancreas, kidneys and liver presented nothing unusual; intestines, examined throughout their whole track, presented nothing abnormal; no development of Peyer's patches; the bladder was distended with urine.

Case X. The case was of a child in Sutton, aged five years, which died eight hours after invasion of the disease. There was nothing abnormal found in the examination, except a turgid state of the meningeal vessels, and a pulpy condition of the spinal marrow. The body was covered with purple petechiæ, a line or so in diameter, and not raised. The same were found on the peritoneal face of the stomach, and were confined to the peritoneum.

The patient in Case VI. lived the longest of all the fatal cases—thirteen days. The invasion in both V. and VI. was less sudden than frequently occurs. Case VII. seems to have been an instance of slight anatomical lesion attributable to the rapid termination.

Dr. Terry, now of Connecticut, but formerly of Sutton, Mass., gives us the following information in regard to his cases in that town in 1849.

Dr. Terry had six cases from the 26th of February to the 27th of March, 1849. Of these, four were males, and two were females. He says the whole region over which the disease extended, viz., Sutton, and the neighborhood, has a soil very retentive of moisture, and a damp atmosphere. The patients, with the exception of one fifty years of age, averaged ten years. The earliest age was five years. The section in which the disease prevailed, may be roughly estimated to be eight miles long and five wide. Scattered cases

of extreme severity occurred at about the same time in nearly all parts of that section. In a few instances several members of a family were attacked, but generally only one member. Dr. T. found no evidences of contagion. The average duration of the cases was fourteen days, the longest forty days, the shortest ten hours. Convulsions occurred in two cases of the six.

Headache was present and very severe in all the cases but one; in that one there was profound stupor from the onset. There was delirium in nearly all the cases, but not violent. The patients disliked to be moved or touched. When aroused to answer a question, the answer was usually short and petulant, sometimes logical, sometimes not. The head was drawn backwards in nearly all the cases. In one case the body was curved backwards nearly to a semi-circle. Petechiæ occurred before death in two at least of the six cases, and remained after death. Dr. Terry thinks they covered the bodies after death in most cases, but cannot positively so state.

Dr. Terry had but one post-mortem. That was in a case of a boy five years old, who died in ten hours after the attack. Dr. T. finds a memorandum, which says, "the large veins and sinuses of the brain were found much engorged with blood, the membranes (cerebral and spinal) injected, the spinal cord softened. Much turbid serum had been effused." Only the upper part of the spine was examined.

The treatment was by emetics and cathartics in the commencement, followed by diaphoretics, blistering the nucha, sinapisms to the legs and other parts. Warm baths in some instances. Only one of the cases was freely bled, and that was the only one that recovered.

Dr. H. E. McCollum claims to have had a few cases of the disease in Barnstable, in November, 1847. There were petechiæ, but no opisthotonos.

THE PRESENT EPIDEMIC,*

AS RELATES TO MASSACHUSETTS.

THE question of the present epidemic in this State is now before us.

We will begin this part of our report with two cases, which we give from the records of the Boston Society for Medical Improvement, as specimens.

CASE XI. April 11th, 1864. *Cerebro-Spinal Meningitis.* Dr. Ellis reported the following case.

On April 4th, a young man came home from a store, in which he was employed, with a slight headache, but as he had been subject to this for several years, it attracted no particular attention. In the evening, however, it increased, and was followed by vomiting during the night. He continued about the same through the following day, and sat up long enough to have his bed made; but that evening he made strange answers, and sat up in bed. A homœopathist was called, but before his arrival the patient was attacked with spasms, which continued till towards morning, when the patient died suddenly, thirty-six hours after the commencement of the disease. The symptoms were attributed to poisoning, and no medicine was given.

At the examination made on April 6th, at 4, P.M., the arachnoid was found dry, and the convolutions somewhat flattened. There was no perceptible change in the cerebral substance, nor effusion into the lateral ventricle. The pia

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* Our account is necessarily made up no later than January, 1866, most of the cases reported to us having been sent in before that time.

mater of the brain and spinal cord was opaque and infiltrated with thin pus. No apparent change in the tissue of the spinal cord. The bladder contained a large amount of urine. The spleen was somewhat enlarged.

Dr. Ellis remarks that "although the amount of pus was not so great as in some cases, the appearances were unequivocal." The short duration of the case may perhaps explain the limited development of the disease.

Case XII. April 11th, 1864. Dr. Coale reported the following case.

E. B., aged fourteen weeks, a healthy infant, about January 27th, was observed to be restless and fretful, and to throw herself backwards frequently. Gradually her habitual position became one of flexion of the spine backwards, particularly in the region of the neck. She was brought to Boston and put under Dr. C.'s care, February 10th, just two weeks after the first signs of the attack. He found her lying on the side, the head bent backwards. The spine was also curved. The pulse was 100, regular. The bowels somewhat costive. There was no twitching of the limbs, no distortion of the face or squinting. The pupils were contracted. This state of things continued without alteration, except an increase in the intensity of the symptoms. Death took place February 19th, twenty-three days from the first appearance of the disease. At the time of death there was thorough opisthotonos, the trunk being bent backwards in the form of a semi-circle. There was no discoloration nor any spots on the skin. The treatment consisted in alteratives and revulsives to the spine, but without effect.

Though there was no autopsy in the last case, we consider it sufficiently characteristic to be of interest.

THE Committee now offer the results of certain special investigations made by them, as to the history of the present epidemic in this State.

SPOTTED FEVER, OR CEREBRO-SPINAL MENINGITIS IN PUBLIC CIVIL ESTABLISHMENTS OF THE STATE.

WE have made inquiries as to the occurrence of the disease in certain of the public civil establishments of the State, taking the entire list of "State Charities," so called, with the exception of the Hartford Asylum for deaf mutes, which is not in the Commonwealth; and also of the Eye and Ear Infirmary, which is omitted for obvious reasons. This list is as follows, viz.:

The Blind Asylum at South Boston; the Idiotic School at South Boston; the Westborough School; the Lancaster School; the Tewksbury Almshouse; the Monson Almshouse; the Bridgewater Almshouse; the McLean Asylum at Somerville; the Taunton Hospital for the Insane; the Northampton Insane Asylum; the Worcester Insane Hospital; the Lunatic Hospital at South Boston; the School Ship in Boston Harbor; the Hospital at Rainsford Island, Boston Harbor; the Deer Island Hospital, Boston Harbor; the Washingtonian Home, Boston; the County Receptacle at Ipswich; the House of Correction at South Boston; the State Prison at Charlestown; the Massachusetts General Hospital, Boston.

Together with this list should be taken into account the Boston City Hospital; and the Dale General Hospital, at Worcester, which latter, though an asylum for soldiers, is hygienically not of a military character.

In the Massachusetts General Hospital there have been

two cases. The patients having been carried there with the disease upon them, they are to be credited to the city of Boston, and do not count here.

In the Boston City Hospital there were, during the winter of 1864 to '65, *five* cases, *which originated in the Hospital.*

In the Monson Almshouse there have been *two* cases. In none of the other above-mentioned institutions have there been any cases.

THE DISEASE IN THE LATE MILITARY ESTABLISHMENTS WITHIN THE STATE.

We have also obtained, through the kindness of Assistant Surgeon General Hooker, the following list of the Military Camps and Rendezvous of Massachusetts, viz.: Camp Wool, Brook Farm, and Camp at Fair Grounds, Worcester; Camp Cameron, North Cambridge; Camps Stanton and Schouler, Lynnfield; Camps Massasoit, Brigham, and Meigs, Readville; Camps Wilson, etc., at Lowell; Camp Stanton, at Boxford; Camp Joe Hooker, Lakeville; Camp Stevens, Groton Junction; Camps Reed and Banks, Springfield; Camp Miller, Greenfield.

In none of these camps, all of which were remarkably free from sickness of every kind, was there any of the "spotted fever," or "cerebro-spinal meningitis."

But, in the same category belong the military establishments in Boston Harbor. Of these, Gallop's Island, Fort Warren, and Fort Independence, only have held any considerable bodies of men; and the two first—Gallop's Island and Fort Warren—alone have been visited by the dis-

ease. At Gallop's Island there have been 19 cases, and at Fort Warren 4 cases. The four cases at Fort Warren were recruits who went from Gallop's Island during the prevalence of the disease at the latter place, and are considered, by the medical officer reporting them, as to be credited to Gallop's Island.

At other places there have been only small garrisons or guards. Among these there has been none of the disease, as we are assured by a letter from Dr. Mc Laren, the Medical Director, which tells us that, with the above exceptions, it has not occurred in any of the forts, camps or rendezvous in his district.

SPOTTED FEVER OR CEREBRO-SPINAL MENINGITIS NOT PROVED TO BE A "MILITARY DISEASE" BY THE LATE EXPERIENCE OF MASSACHUSETTS.

We find ourselves unable to set up a numerical comparison of the civil with the military establishments in the State, as to the relative amount of the disease among them, because while the former are permanent, the latter have existed for limited periods; because the numbers of troops at different points have of course fluctuated a good deal; and because of other varying circumstances in the history of the camps.

We are reduced to saying that the disease has occurred to a slight extent in a small proportion of the civil institutions above mentioned, i. e., in 2 out of 22; and also in a small proportion (2) of the whole number of military establishments in the State, however reckoned—considerably in one, to a slight extent in the other.

We may, however, remark that there have been one or more military camps, at different points, or successively at the same point, in ten towns in the State; and, also, considerable bodies of troops on three of the Islands in Boston Harbor, besides the inconsiderable garrisons or guards already mentioned. Where two or more camps are set down as in the same town, they have occupied the same spot either successively or together, except in Worcester, in which place the camp at Brooks Farm and that at the Fair Grounds were on widely separated sites.

Worcester, then, should be considered as furnishing *two* distinct military centres; the other 9 towns, *one* each. We may say, therefore, taking the eleven camps on the main-land, together with the three islands above mentioned, that the disease has occurred in 2 out of 14 principal military centres, so to speak, within the limits of the State.

Though the records of "spotted fever," or "cerebro-spinal meningitis," in this State, consist largely of cases from private practice, most of which we have not yet presented, we will here give our impression that while the experience of Massachusetts does not furnish grounds for any definite conclusions as to whether the disorder does, or does not, specially affect military camps or barracks, yet on the other hand it does not authorize us to consider it, as it is regarded by some in France, a military disease.

Over-crowding alleged to be a cause of the Disease.

Dr. Page makes an interesting statement as to the behavior of the disease at Gallop's Island. He says the September case occurred at a period of great over-crowding. This over-crowding was abated, and nothing more was seen of the disease till January 29th, when the barracks were again over-crowded, there being from 130 to 180 men in a barrack intended for 100. Dr. Page presaged the renewal

of trouble, and reported the danger to the Government, begging that the over-crowding might be relieved, but in vain.

The cases went on appearing one after another, till the surplus number of men were shipped off, when it ceased. Dr. Page expresses a decided opinion that the disease at Gallop's Island arose from over-crowding.

Now, the question may be asked, whether the occurrence of the disease in military establishments be not owing, *generally* or *frequently*, to crowding too many men together in tents and barracks, rather than to any thing special in military life. If such should be found to be the case by any having a large number of military statistics within reach, such crowding can only be admitted to be *one* of the causes of the malady, since, as we have seen, it has preferred the country town, or village, to the large city, and has often visited the solitary farm-house. At the City Hospital, too, the patients were the reverse of crowded, and their wards were remarkably well ventilated.

Number of Cases in the Towns where there were Military Camps.

We subjoin, as perhaps not uninteresting, a statement of the number of cases reported in the towns in which were situated the military camps.

In Worcester, with 24,960 inhabitants (by last census), there were 6 cases; in North Cambridge, —— inhabitants, no cases; in Lynnfield, with 866 inhabitants, 1 case; in Dedham (including Readville), with 6,330 inhabitants, no cases; in Lowell, with 36,827 inhabitants, no cases; in Boxford, with 1,020 inhabitants, 1 case; in Lakeville, with 1,160 inhabitants, no case; in Groton,* with 3,193 inhabitants, no cases; in Springfield, with 15,199 inhabitants, 11 cases; in Greenfield, with 3,198 inhabitants, 3 cases.

* In Dedham, Lowell, and Groton, the negative evidence is very decided.

At the U. S. military posts in Boston Harbor, where the disease appeared, the military were the only inhabitants.

It appears from this statement that the epidemic had rested somewhat upon some of the towns where were the military establishments, while in others of those places it had not shown itself. Yet, in none of such establishments, except those in Boston Harbor, with no civil surroundings, did the disease occur.

An examination of the tables shortly to be given, will show that in none of the places where the disease struck its strongest blows, were there military camps, rendezvous, or barracks.

Proportion of Recruits affected.

Are *recruits* more liable, as has been stated in France, to "spotted fever," or "cerebro-spinal meningitis," than veterans? The affirmative is not sustained by the experience of Gallop's Island. At that place there were 19 cases reported, besides very slight ones not recorded; 13 of these 19 were recruits; 4 old soldiers; 2 not described. But, of the old soldiers on the Island, Dr. Page writes us, twenty-five hundred were recruits, and four hundred of permanent garrison. Therefore, while the recruits on the Island were to the permanent troops as about 6 to 1, the number of recruits who had the disease to that of the veterans sick with it, was only between 3 and 4 to 1; and that, even if we count as recruits the "two not described."

THE CASES OF THE PRESENT EPIDEMIC IN MASSACHUSETTS (AS COLLECTED UP TO JANUARY, 1866), ARRANGED IN TABULAR FORM.

We have consulted the State Registration reports in the hope of finding in the registry of deaths, a statement of the numbers of persons who have died of "spotted fever," or "cerebro-spinal meningitis." But neither of these nosological terms appear among the "causes" of death. We have fared no better with the report of the Registrar of the City of Boston.

The information we have to present as to the experience of private practice has, with the exception of what we have derived from a few published cases, been obtained by correspondence with the Fellows of this Society. Circulars were printed, with the following heading, viz.:

"Boston, August 1, 1865.

"*Dear Sir:*—The Committee of the Massachusetts Medical Society on 'Spotted Fever,' respectfully ask you to fill out this blank with reference to any cases of 'Spotted Fever'—otherwise termed 'Cerebro-spinal Meningitis'—which may have occurred in your practice. If you have not had any cases, the Committee nevertheless earnestly ask you to write 'No' to the first question, and forward as directed.

"Please transmit to the undersigned, at No. 6 Chestnut Street, Boston, Mass. For the Committee,

"Luther Parks, Jr., M.D., *Chairman.*"

The Circulars were mailed to each Fellow of the Massachusetts Medical Society. To address them we procured

the services of the book-keeper of the Boston Medical and Surgical Journal, who had the most perfect list extant of the members of the Society. He informs us that he sent out over nine hundred. It is to be regretted that the importance of returning negative replies was not universally appreciated, as we are left without reports from a large proportion of the towns in the State; though the thanks of the Society are due to the associate members of the Committee for their efforts to get the circulars returned.

The Chairman wrote to the other members of the Committee asking them to canvass their respective districts. He feels assured that they used every exertion to get the circulars sent in; and, from the tone of their correspondence, is led to the belief that no considerable number of recognized cases remain unreported.

The queries propounded in the circulars need not be stated here, as they can be inferred from the headings of the tables below. Other important questions we should have been glad to put, but acting by advice, we aimed at making the list of queries as short as possible, and felt that, as it was, it had extended to as great a length as the indulgence of our correspondents would bear.

The total number of cases directly reported, and which will be reckoned upon, in calculating the ratios of ages, symptoms, &c., is 287. But in apportioning these cases among their respective counties, two of them must be excluded, as having occurred in Whitingham, Vermont. These, however, are grouped together with others of Dr. Temple, in Heath and Rowe, Berkshire County, and cannot be isolated in taking account of the symptoms and other circumstances. Whitingham adjoins Heath and Rowe.

Likewise in the above-mentioned apportionment of cases among the *Counties*, there are 23 cases which occurred in Boston Harbor, which are to be left out; as also should 7

cases in Brookline, Norfolk County, occurring in 1866, while the reports for the other towns were closed before the present year.

For this reason, again, in reckoning the number of *towns* (relatively to their respective Counties), which sent affirmative replies, Brookline must be excluded. In the remaining calculations all the 287 cases will be counted in.

With this preface we give the tables we have prepared to embody the replies which have been received.

Tables comprising 287 Cases.

When there is not room in the tables for "Autopsies, Treatment, Remarks," these are appended, the cases to which they refer being indicated by Roman numbers corresponding with similar numbers in the tables.

Reading the tables horizontally we get a sketch of each case, or set of cases, so far as furnished by their reporters; reading vertically we obtain the aggregate results as bearing upon the several points investigated in the tables.

NAMES OF TOWNS.	Names of Reporters.	No. of Cases.	Their Dates.	Sources of the Disease.	Locality. High or low, damp or dry.	Districts thickly or sparsely settl'd	Condition of Patients.	Average Age.	Adult Age.	Of Adults. Adv. Age.	Of Adults. Mid. Age.	Adolescence.	Childhood or Infancy.	Greatest Age.	Earliest Age.	Males.	Females.	First case in Town, so far as my Reporter.	Last case in Town, so far as my Reporter.	Sporadic or Epidemic.	Cases showing evidence of Contagion.	Average Duration.	Shortest Duration.	Greatest Duration.	Convulsions. No. of cases in which they occurred.	Headache. No. of cases in which it occurred.	Delirium. Character of.	Opisthotonos severe.	Opisthotonos slight.	Tenderness at Nucha.	Pulmonary and Pleural Symptoms.	Cardiac.	Abdominal.	Morbid Appearances of the Skin.	Terminat'n. Recov'd.	Terminat'n. Fatal.	Autopsies.	Treatment.	Remarks.
Becket, *Berkshire.Co.*	E. G. Wheeler, M.D.	8	Apr. 5, '57,—1 case 7, 1 Oct. 31, 1 Mch. 6 to 14, '58, 5 cases.	Not known.	Six cases in a hollow where 3 small streams meet; seven mililiams in village. Two cases high and dry.	No preference.	All in easy circumstances.		about 4				about 4	45 yrs.	5 m.	5	3	Apr. 5, 1857.	Mar. 14, 1858.	In 1857, sporadic. In 1858, epidemic.	0	Less than 3 ds.	12 h.	3 ds.	All 8 cases.	Violent in all who were sensible—7 cases.	In all 8 cases—wild in 1. In the other 7 cases, logical answers till coma set in.	6 cases.	2 cases.	In 5 cases; the others unconscious when seen.	In 2 cases respiration laborious and irregular.	In 6 cases, pulse feeble, frequent, thready. In 2 some "reaction."	In 3 cases, severe pain in bowels, and vomiting at outset.	Petechiæ in all, and great sensibility and soreness of the cutaneous surface.		8	None.	I.	I.
Pittsfield, *Berkshire Co.* Adams, *Berkshire Co.* Hinsdale, *Berkshire Co.*	Wm. W. Greene, M.D.	5 1 1	In 1863 1 case. 6 cases '64 to '65.	Not known.	No preference.	No preference.	No preference.	25 yrs.	4		Chiefly.		3	45 yrs.	2½ yrs.	5	2	Feb. '63. Pittsfl'ld	June '65 Pittsfl'ld	Sporadic.	0	About 15 ds.	2 ds.	21 w. to convales.	In 4 out of the 7: i. e. in all the children and 1 adult.	In all 7.	In 5 out of the 7. 4 out of the 5 gave logical answers.	6 out of 7.	1 out of 7.	In all extreme.	None marked. 0	Pulse rapid, sufficiently strong.		In all but 1, 6 out of 7, irregularly shaped spots, varying in size from a millet seed to a split bean; rose color or darker; not disappearing on pressure.	4	3	3 Sec II.	II.	II.
Shutesbury, *Franklin Co.* Leverett, *Franklin Co.* Belchertown, *Hampshire Co.* Amherst, *Hampshire Co.*	David Rice, M.D.	1 1 1 1	1 in Ap., 1 in May, 2 in June, 1865.	Supposed to be the same as those of diphtheria.	No preference.	Sparsely.	All in easy circumstances.	40 yrs.	4		Chiefly.			65 yrs.	35 yrs.	4	0	June '65 Leverett	June '65 Leverett	Sporadic.	0	3 w.	3 w.	3 w.	0	Severe pain in the head of all 4, extending down the spine.	Mild delirium, tending to coma, in 1 case only. Logical answers.	0	2	In all.	Difficult respiration in 4. Pain in chest in 1.	"Pulse in one, 40 for several days, with coma and much irregularity."	0	0		4	0	III.	III.
Montague, *Franklin Co.*	D. Bradford, M.D.	1	Jan. 13, 1864.	Exposure to cold nights.	High, dry.	Sparsely.	Poor.	18 yrs.				1		18 yrs.	18 yrs.	1		Jan. 13, 1864.		Sporadic.	0	5 ds.	5 ds.	5 ds.	0	1	Delirium most of the time. Logical answers occasionally.	1	0	1	Cough.	Pulse 100 to 125.		Petechiæ last 3 days, and at death livid or purplish spots, mostly on trunk.		1	0	IV.	
Prescott, *Hampshire Co.*	David Rice, M.D.	1	July, 1865.	Patient, a physician; saw a case of the disease two weeks before his attack.	High and dry. Typhoid fever prevails much.	Village, sparsely.	Easy circumstances.	38 yrs.	1		1			38 yrs.	38 yrs.	1				Sporadic.	Yes? See Sources.	2 w.	2 w.	2 w.	0	Severe pain in head, and extending whole length of spinal column.	Obtuseness of intellect with disposition to coma. Could be roused at any time.	0	0	1 great.	0	Pulse very variable, 40 to 100.	0	0		1		0	Revulsives, epispastics, stimulants, tonics.	Convalescence slow.
Heath, *Franklin Co.* Rowe, *Franklin Co.* [Whitingham, State of Vermont.]	C. Temple, M.D.	1 1 2	Feb. 1 to July 1, 1864.	Not known.	High.	Sparsely.	No preference.	28 yrs.	Chiefly.		Chiefly.		1	55 yrs.	11 yrs.	4		Feb. '64.	Apr. '64.	Epidemic.	0	19 ds.	4 ds.	60 ds.	1	In all 4 very severe.	In all 4. Logical answers in one only.	3	1	4		Pulse small, frequent, hard.	0	All 4 cases petechiæ. In 3 appeared the 2d day on the body, but little on the limbs. In the other case only on the back, and were of a very dark purple color.	1	3	0	V.	The cases in Whitingham, Vt., cannot be separated from the others in the answers to the Circular. See also V.
Westfield, *Hampden Co.*	James Holland, M.D.	17	Jan. '58, 1 case. Feb. 5 Mch. 3 Apr. 3 Jan. '65, 1 Feb. 1 Mch. 1 Apr. 1 July 1	"Some peculiar condition of the atmosphere" in 1858. In 1865, the 5 cases traceable to over-exertion and exposure to cold and wet.	No preference.	No preference.	No preference.	19 yrs.	Of 12, ch'fly adults.				5	72 yrs.	11 m.	The 12 in '58 not mention'd. In '65 4	In '65. 1	Jan. '58.	July '65.	In 1858, epidemic. In 1865, sporadic.	0	About 33 ds.	20 h.	163 ds	0	Severe pain in head, and extending down neck and back, in every case where the sufferer could speak.	Delirium present more or less in all the 17 cases. Its character was very variable. For the most part, however, shown in low muttering. Logical answers generally.	In all the 12 cases of '58. Not ment'ned in those of 1865. See "remarks."	Slight in no case.	In all more or less.	In most cases, constriction at chest; respiration often hurried and laborious. In no case were the lungs or pleurre involved.	No morbid changes in heart before or after death in first stage; pulse rapid, small, and in many cases imperceptible. Afterwards variable.	Sense of constriction.	In every case in '58; none in '65. Bright red spots after a few h. becoming purple or livid, on face, neck, trunk and limbs; numerous in most cases; form irregular; size from 2 to 12 l. dia. not raised. In 1 case spots disap. end of 3d w. but on 7th w. returned in greater num. This patient, a boy of 9 y. died 10th w.	3 In '58, 11 out of 12 died.	14 In '65 3 out of 5 died.	VI.	VI.	VI. 5 relapses, 3 of them fatal. The 5 cases in 1865, children.
Williamsburg, *Hampshire Co.*	W. M. Trow, M.D.	1	Dec. 4, 1863.	Not known.	No preference.	Village, sparsely.	Easy circumstances.	39 yrs. about.	1		1			39 yrs.	39 yrs.		1	Dec. 4, 1863.	Dec. 4, 1863.	Sporadic.	0	36 h.	36 h.	36 h.	0	Very severe.	Brief.	0	0	0	0	Pulse very small and frequent.	0	0		1	0	Alterative and stimulant.	VII.
Northampton, *Hampshire Co.*	A. W. Thompson, M.D.	6	Feb. 27 to April 28, 1864.	Contagion supposed, except the first case.	Low and damp.	Medium.	Poor.	33 yrs.	6	2	4			50 yrs.	23 yrs.	2	4	Feb. 27, 1864.	Apr. 28, 1864.	Sporadic.	Yes.	3 w.	2 w.	4 w.	0	In 6 cases, in one intense.	In 2 out of 6 cases, active. In 1, no logical answers.	0	2	I fol. by paralysis of muscles of neck.	Pneumonia in 4, pleuro-pneumonia in 1.	Pulse rapid in 4 cases.	1 tympanites	Petechiæ in 3 cases. In one, face and neck, dark mahogany color, looking as if "struck with a nutmeg grater." Spots desq. lividity	6		0	VIII.	VIII.
Granby, *Hampshire Co.* Ludlow, *Hampden Co.* Belchertown, *Hampshire Co.*	L. E. Marsh, M.D.	12 1 2	1 in Oct. 1862. 1 Apr. 1864. 2 Mch. 1865. 1 Feb. " 3 Apr. " 3 May, " 1 June. " 1 July, " 1 Aug. "	Theory of poison in atmosphere.	No preference.	No preference.	No preference.				The adults mostly.		Chiefly.	45 yrs.	4 m.	7	8	Oct. '62. Granby.	Aug. '65 Granby.	Sporadic.	0	8 ds.	24 h.	6 w.	In 2 cases.	Violent in every case.	In almost all the cases; generally low muttering. Logical answers in almost all.	Say 3 cases.	Say 10 cases.	In nearly all.	Say 7 cases. See "Remarks."	Pulse extremely rapid in all. From 120 to 200.	Nausea in 1 case.	In say 7 cases, spots like those in typhoid fever.	10	5	0	IX.	IX.
Greenwich, *Hampshire Co.*	J. W. Goodell, M.D.	7	1 Jan. 19, 1865. 1 24, " 1 28, " 1 29, " 2 Feb. 3, " 1 5, "	Not known. Followed severe cold weather.	Dry plain. See "Remarks."	Sparsely.	Easy circumstances.	19 yrs.			The adults mostly.		Chiefly.	63 yrs.	2 yrs.	3	4	Jan. 19, 1865.	Feb. 5, 1865.	Epidemic.	0	about 4 d.	12 h.	7 ds.	4	Say 5 in back of head.	2 cases, logical answers at times.	4	2	0	In 1 only—in that well marked pneumonia 3 days before any symptom of meningitis.	Heart's action very feeble. Pulse fluttering and intermittent.	In 6 cases bowels costive. Vomiting & purging in other.	Petechiæ well marked in all.	0	7	0	X.	X.

NAMES OF TOWNS.	Names of Reporters.	No. of Cases.	Their Dates.	Sources of the Disease.	Locality. High or low, damp or dry.	Districts thickly or sparsely settl'd.	Condition of Patients.	Average Age.	Adult Age.	Of Adults. Adv. Age.	Of Adults. Mid. Age.	Adolescence.	Childhood or Infancy.	Greatest Age.	Earliest Age.	Males.	Females.	First case in Town, so far as Regular Reporter.	Last case in Town, so far as Regular Reporter.	Sporadic or Epidemic.	Cases showing evidence of Contagion.	Average Duration.	Shortest Duration.	Greatest Duration.	Convulsions. No. of cases in which they occurred.
Westfield, *Hampden Co.*	Geo. G. Tucker, M.D.	16	3 winter and spring of 1858. 8 from '61 to '65.		Wholly dry and high.	Country town. Sparsely.		See "Remks."						38 yrs.	2½ m.	See "Remks."		Feb. '57.		Epidemic.	0		12 h.	3 m. Fatal.	Spasmodic action frequent.
Westfield, *Hampden Co.*	J. G. Abbott, M.D.	3	1859.		ditto.	Sparsely.	Easy circumstances.	about 35 yrs.	3		3			50 yrs.	30 yrs.		3	.					4 ds.		
Greenfield, *Franklin Co.* Westfield, *Hampden Co.* Springfield, *Hampden Co.*	W. G. Breck, M.D.	3 5 10	1864. 1861. 2 in '62; 3 in '63; 3 in '64 (Mch. and Apr.); 2 in '65.	Not known.	No preference.	No preference.	No preference.	Say 15 yrs.	"See Remks."					35 yrs.	5 yrs.	Of 10 cases in Sprigf 6	4	Springf. 1862.	Springf. April, 1865.	Epidemic. " Sporadic.	0	3 m.	1 m.	8 m.	A frequent occurrence.
Springfield, *Hampden Co.*	M. Calkins, M.D.	1	March, '65.	Not known.	Damp.	Thickly.	Poor.	Say 35 yrs.	1		1			Say 35 yrs.	Say 35 yrs.	1		Feb. '65.	Apr. '65.	Sporadic.	0	2 w.	2 w.	2 w.	"Cramps" in the arms and hands.
Monson Almshouse, *Hampden Co.*	J. D. Nichols, M.D.	2	17th and 18th May, '65.	Not known.	No preference.	Almshouse on a hill by itself.	Almshouse.	5 yrs.					2	7 yrs.	3 yrs.	1	1			Epidemic in town.	0 In wards distant *inter se.*	25 h.	24 h.	26 h.	2 cases.
Monson, *Hampden Co.* Palmer, *Hampden Co.*	Wm. Holbrook, M.D.	1 8	Feb. 9 to Mch. 5, 1865.	Not known.	No preference.	No preference.	No preference.	8 yrs.					Chiefly.	21 yrs.	18 m.	6	3	Feb. 9, 1865. Palmer.	Mar. 5, 1865. Palmer.	Epidemic.	0	about 24 h.	12 h.	5 w.	Most of the cases; some early, others late in the disease.
Palmer, *Hampden Co.* Monson, *Hampden Co.*	Samuel Shaw, M.D.	12 2	Feb. 10 to Apr. 1, 1865.	Not known.	No preference.	No preference.	No preference.	20 yrs.	4				10 fr. 7.12 yrs.	35 yrs.	5 yrs.	7	7	2 cases 1858.	Apr. 4, 1865.	Epidemic.	0	5 ds.	22 h.	7 ds.	
Athol, *Worcester Co.*	J. P. Lynde, M.D.	5	2 in March, 1 in April, 1 in Dec., 1864. 1 in Jan. 1865.	Not known.	No preference.	No preference.	No preference.	about 10 yrs.					5	14 yrs.	7 yrs.	2	3	Mch. '64	Aug. '65	Sporadic.	0	39 h.	24 h.	52 h.	2 cases. In one early, in the other late in the disease.
Athol, *Worcester Co.*	Ditto *(additional).*	1	Aug. 1865.					6 m.					1	6 ms.	6 m.	1		.		Sporadic.	0	31 h.	31 h.	31 h.	0
Petersham, *Worcester Co.*	F A. Wood, M.D.	4	1864.	Not known.	The whole town is high.	Sparsely.	No preference.	11 yrs.					Chiefly.	18 yrs.	2 yrs.	4		Mch. '64	Aug. '64	Sporadic.	0	Say 3½ ds.	3 ds.	4 ds.	All 4 cases. With outcries in every case.
Dana, *Worcester Co.* New Braintree, *Worcester Co.* Hardwick, *Worcester Co.*	Almon M. Orcutt, M.D.	1 1 9	Hardwick, Feb. 16, 1864, Feb. 18, " Mch. 3, " " 9, " " 11, " " 8, " Feb. 12, 1865, " 17, " Apr. 21, " Dana, Mch. 1, '64. N. Braintree, Apr. 26, 1864.	Not known.	No preference.	Sparsely.	No preference.	27 yrs.	No pref. betw. adults and children.					53 yrs.	6 yrs.	6	5	Feb. 16, 1864. Hardwick.	Apr. 21, 1865. Hardwick.	Epidemic.	0	18 ds.	5 ds.	45 ds.	
New Braintree. *Worcester Co.* Oakham, *Worcester Co.* North Brookfield, *Worcester Co.*	S. P. Martin, M.D.	1 2 1	Mch. 2, 1864. " 23, " " 14, " Oct. 13, "	Not known.	No preference.	Sparsely.	4 easy circum.	about 32 yrs.	2	1	1		2	65 yrs.	6 yrs.			March, 1864. New Br.		Sporadic.	0	about 18 ds.	2 ds.	38 ds.	4 cases. Most frequent in the 2 children.

NAMES OF TOWNS.	Headache. No. of cases in which it occurred.	Delirium. Character of.	Opisthotonos severe.	Opisthotonos slight.	Tenderness at Nucha.	Pulmonary and Pleural Symptoms.	Cardiac.	Abdominal.	Morbid Appearances of the Skin.	Terminat'n. Recov'd.	Terminat'n. Fatal.	Autopsies.	Treatment.	Remarks.
Westfield, *Hampden Co.*	Frequent.	rally occurred. answers in those idently attacked. ases of sudden vasion, no.	Say 6 cases.	Say 10 cases. i. e. some in all.		Slight bronchal irritation, and congestion in some cases.	None well marked.	Costivencss. Slight diarrhœa, flatulence in some.	Not mentioned.	4	12	S	XI.	XI. Young lads for most part.
Westfield, *Hampden Co.*										2	1		XII.	
Greenfield, *Franklin Co.* Westfield, *Hampden Co.* Springfield, *Hampden Co.*	Constant and severe.	or less in every Logical answers ccasionally.	In every case.	0		Not observed.	Pulse various.		In every case petechiæ, being purple or copper-colored, from size of a pin's head to that of a half dollar.	*Greenfield and Westfield not mentioned.* Spr. 4	Spr. 6	2	XIII.	3 cases in Greenfield, adults. 5 in Westfield, children and adults. 10 in Springfield, under 12 yrs. XIII.
Springfield, *Hampden Co.*	Severe, principally in the occipital region.	Slight.			Great soreness, stiffness and tenderness.					1		0	XIV.	
Monson Almshouse, *Hampden Co.*	.	Both patients comatose.	1	1	.				Petechiæ in 1 case.		2	0	Counter-irritants to the spine—veratrum viride.	
Monson, *Hampden Co.* Palmer, *Hampden Co.*	Several complained of severe headache; others but little.	More or less in nearly all the cases. Logical answers sometimes, at other times comatose state.	Opisthotonos in nearly all. 1 or 2 only slightly.		9	Hurried respiration, as a general statem't.	Pulse rapid, increasing to 150 and 175.		None had petechiæ during life; after death 2 or 3 had spots like purpura, and 1 or 2 had a purple or leaden color.	4	5	0	XV.	
Palmer, *Hampden Co.* Monson, *Hampden Co.*	In all.	In all the cases not relieved in the first 24 hours. Logical answers.	2 cases.	4 cases.	Say 10 cases.	0	Pulse wiry, very rapid, often 150.		No petechiæ during life. In 1 case discoloration of the skin after death.	12	2	0	XVI.	
Athol, *Worcester Co.*	Severe in all 5, in forehead.	In all 5 cases. Logical answers for a time; afterwards stupor.	1 case.	2 cases.	Not observ'd and not looked for.	Respiration hurried and sighing.	Pulse very rapid, sharp and feeble. Action of heart "feeble and oppressed."	Vomiting.	Skin livid or purple, puffy. Eruption of rose spots or petechiæ, size of split pea; pur. not disap. on pres.—over trunk and extr.		5	0	Expectant, supporting, stimulating.	
Athol, *Worcester Co.*			0	0		Respiration excessively hurried.	Pulse very rapid.	Vomiting.	Skin livid and purple—at first, cold.		1	XVII.	Stimulating.	
Petersham, *Worcester Co.*	All 4 cases.	In all 4 cases. Logical answers in only 1 case. That recovered.	In all 4.		In 3 cases.	0	0 Pulse not mentioned.	Vomiting generally in first stage.	No spots.	1	3	0	XVIII.	
Dana, *Worcester Co.* New Braintree, *Worcester Co.* Hardwick, *Worcester Co.*	Severe in all; "terrible" in 3 fatal cases.	In all 11 cases. In the 8 recoveries, logical answers. In one of the fatal cases also. In the other two fatal cases, no logical answers.	In all 3 fatal cases.	In all 8 recoveries.	In all 11 cases.	More or less frothy expectoration, with occasional "bastard pleurisy."	Pulse in early stage feeble; in stage of re-action, fuller, but not very frequent.	Vomiting in all. Constipation, with retention or suppression of urine, frequent.	Spots not particularly marked. Where any portion of the body rested upon the bed-clothes there would be a spot. In the earlier stages of the 3 fatal cases, the skin had a mottled appearance.	8	3	0	XIX.	1 relapse, fatal. Robust and feeble had the same appearance soon after attack.
New Braintree. *Worcester Co.* Oakham, *Worcester Co.* North Brookfield, *Worcester Co.*	All 4, but not severe.	All more or less. All gave logical answers.	3 cases; 1 adult, 2 children.	1	All 4.		Pulse in the 2 children rapid, and feeble in the 2 adults—from 80 to 100.		0		4	0	XX.	

NAMES OF TOWNS.	Names of Reporters.	No. of Cases.	Their Dates.	Sources of the Disease.	Locality. High or low, damp or dry.	Districts thickly or sparsely settl'd	Condition of Patients.	Average Age.	Adult Age.	Of Adults. Adv. Age.	Of Adults. Mid. Age.	Adolescence.	Childhood or Infancy.	Greatest Age.	Earliest Age.	Males.	Females.	First case in Town, so far as known by Reporter.	Last case in Town, so far as known by Reporter.	Sporadic or Epidemic.	Cases show Contagion or Contagion.	Average Duration.	Shortest Duration.	Greatest Duration.	Convulsions. No. of cases in which they occurred.
East Brookfield, *Worcester Co.* Leicester, *Worcester Co.*	E. M. Wheeler, M.D.	1 1	April, 1864. July, 1865.		No preference.	Rather thickly settled for country town.	Easy circumstances.	27 yrs.	1		1	1		37 yrs.	17 yrs.	2		April, 1864.	July '65.	Sporadic.	0	4 w.	2 w.	6 w.	0
Brookfield, *Worcester Co.*	J. T. Rood, M.D.	1	March 16, 1865.	Not known.	No preference.	Thickly settled for country town.	Poor.	6 yrs.					1	6 yrs.	6 yrs.		1	Feb. 4, 1865.	Mar. 16, 1865.	Sporadic.	0	8 h. to convales.	8 h. to convales.	8 h. to convales.	8 times an hour on an average.
Barre, *Worcester Co.*	C. W. Whitcomb, M.D.	1	April 6, 1864.	Not known.	Side hill near Ware River.	Sparsely.	Poor.	4 m.					1	4 m.	4 m.		1	April 6, 1864.	Apr. 6, 1864.	Sporadic.	0	45 ds.	45 ds.	45 ds.	1 case.
Westminster, *Worcester Co.* Fitchburg, *Worcester Co.*	Geo. D. Colony, M.D.	1 1	March 28, 1865. April 13, 1865.	Not known.	No preference.	1 thickly settl. 1 sparsely.		12 yrs.								2		July, '64 Fitchb'g	Apr. '65	Sporadic.	0	about 2 ds.	18 h.	3 ds.	0
Worcester, *Worcester Co.*	Benj. F. Heywood, M.D.	4	1 March, ——. 1 " 1864. 1 Feb. 21, " 1 Nov. 22, "	Not known.	No preference.	No preference.	No preference.	about 32 yrs.	2	1	1	2 15 yrs. each.		60 yrs.	15 yrs.	3	1	Mch. —	Nov. '64	Sporadic.	0		3 ds. fatal.	3 w. recov.	3 cases out of 4.
Worcester, *Worcester Co.* Sutton, *Worcester Co.*	Oramel Martin, M.D.	2 1	Jan. 1864. Feb. " April, "	Not known.	No preference.	1 sparsely. 2 thickly.	Easy.	14 yrs.				2	1	19 yrs.	4 yrs.	3		Jan. '64.	1864.	Sporadic.	0	2 m.	2 w.	1 nev. fully recov.	3 cases.
Leominster, *Worcester Co.*	C. C. Field, M.D.	1	March, 1862.	Ditto. Subject taken 36 hours after arrival from camp at Annapolis, where he had been on a visit.	[See last heading.]	[See last heading.]	Easy.	8 yrs.					1	8 yrs.	8 yrs.	1		Mch. '62	1865.	Sporadic.	0	8 w. to convalescence. More than yr. to full health.			1 case confined to back and one side; eight weeks after attack before they ceased.
Upton, *Worcester Co.*	G. W. Ward, M.D.	1	April 4, 1864.	Fall.				2 yrs.					1	2 yrs.	2 yrs.	1					0	42 ds.	42 ds.	42 ds.	0
Upton, *Worcester Co.*	C. A. Wilcox, M.D.	1	March 15, 1864.	Work in a hot room.			Easy.	25 yrs.	1		1			25 yrs.	25 yr.	1				Sporadic.	0	3½ ds.	3½ ds.	3½ ds.	0
Charlestown, *Middlesex Co.*	S. H. Hurd, M.D.	2	April, 1864.	Not known. Possible contagion suggested.	No preference.	Thickly.	Poor.	8 yrs.					2	10 yrs.	6 yrs.	1	1			Sporadic.	?	about 7 w.	3 w.	11 w.	2 cases.
E. Cambridge, *Middlesex Co.*	Anson Hooker, M.D.	1	Feb. 1864.						1								1			Sporadic.	0				
Cambridge, *Middlesex Co.*	J. B. Taylor, M.D.	2	Dec. 1864.	Not known.	No preference.	Thickly.	Poor.	16 yrs.	1		1		1	20 yrs.	13 yrs.		2	Dec. '64	Dec. '64	Sporadic.	0	10 ds.	10 ds.	10 ds.	0
Cambridge, *Middlesex Co.* Somerville, *Middlesex Co.*	J. R. Morse, M.D.	2 2 2	1 Jan. 1865. 2 Mar. " 1 Apr. "	Not known. One case (Mch) had spent two days at Gallop's Island.	No preference. 2 on high ground, 2 on low.	Sparsely.	Easy.	11 yrs.				1	1	17 yrs.	7 yrs.	4		Jan. '65.	Apr. '65.	Sporadic.	0	13 ds. and 10 h.	40 h.	30 ds.	2 cases.
Feltonville, in Marlboro', *Middlesex Co.*	C. W. Barnes, M.D.	2	Oct. 2, 1864. Jan. 4, 1865.	Not known.	No preference.			13 yrs.				1	1	16 yrs.	10 yrs.	2		Oct. 2, 1864.	Jan. 4, 1865.	Sporadic.	0	36 h.	36 h.	36 h.	1

NAMES OF TOWNS.	Headache. No. of cases in which it occurred.	Delirium. Character of.	Opisthotonos severe.	Opisthotonos slight.	Tenderness at Nuchæ.	Pulmonary and Pleural Symptoms.	Cardiac.	Abdominal.	Morbid Appearances of the Skin.	Terminat'n. Recov'd.	Terminat'n. Fatal.	Autopsies.	Treatment.	Remarks.
East Brookfield, *Worcester Co.* Leicester, *Worcester Co.*	2 cases early in the disease.	Slight in both. Logical answers.	0	Both.	Both; extreme in one.	None.	Pulse at first quick, afterwards normal.		In 1 case a few petechiæ on chest and abdomen.	2		0	XXI.	XXI.
Brookfield, *Worcester Co.*	1 case.	Constant for eight hours. No answers.	Very severe.			Respiration excessively labored.	Pulse very small and rapid.		The right half of the body completely covered with petechiæ; the division on the face was perfect; on the back and side the eruption was purple, also on the forehead. As soon as the patient began to improve, the eruption began to subside, and in 24 hours completely disappeared.	1		0	XXII.	
Barre, *Worcester Co.*	Unknown.	Unknown.		Constant.	Not observ'd	None.	None observed.	Nausea and constipation.	No petechiæ or other morbid appearance could be found.	1		0	Calomel and soda only.	
Westminster, *Worcester Co.* Fitchburg, *Worcester Co.*	Severe in both.	More or less in both, with gradual loss of consciousness. Questions answered during first stage.		Both.	0	In 1, respiration hurried and painful.	Heart's action violent; pulse rapid and full in both cases.		Dark spots in both, rapidly increasing—in one closely resembling measles in shape. In one case, over body generally, in the other confined to extremities and petechiæ.		2	XXIII. 0	Stimulation.	
Worcester, *Worcester Co.*	Severe in all 4.	In 3 out of the 4. Logical answers in 2. Delirium low muttering.	In all 4.		Not noticed.		Pulse 90 to 100.	Nausea and vomiting at commencement.	Not marked.	2	2	0	XXIV.	
Worcester, *Worcester Co.* Sutton, *Worcester Co.*	3 cases back part of head.	In all 3. Seemed idiotic. No logical answers.	1 decubitus abdominal.	2	In all 3. Also pain increased by motion.				Petechiæ in all.	3		0	XXV.	XXV.
Leominster, *Worcester Co.*	1 case.	Constant for two weeks. Logical answers seldom. Delirium low muttering.		1 prolonged.	1	Pneumonia in third week for a week.	Pulse 120.		Skin mottled—dark spots on different parts of the body.	1		0	XXVI.	
Upton, *Worcester Co.*	Not remembered.	1 case.		Slight, but continuous.	1				Petechiæ.		1	0		
Upton, *Worcester Co.*	Severe, and paroxysmal at back part of head.	1 case. Logical answers. Delirium low muttering.		1 case disp. to throw head back.	1 case, also pain.		Pulse weak, rapid, variable.	Constipation	None.		1	0	XXVII.	
Charlestown, *Middlesex Co.*	Constant in both cases.	2 cases. Logical answers.	0	0	2 cases.	0	Pulse rapid and feeble.		Petechiæ very marked in both.	2		0	Expectant.	
E. Cambridge, *Middlesex Co.*	1 case.	1 case.			1 case.				Petechiæ.		1	0		
Cambridge, *Middlesex Co.*	Severe in both.	None.	1 case.	0	1 case.	0	Pulse very rapid.		Not marked.		2	0	Narcotics, stimulants, local bleeding, tonics.	
Cambridge, *Middlesex Co.* Somerville, *Middlesex Co.*	Severe in all 4.	3 cases. Logical answers in one case of the 3 delirious.	2 cases.	2 cases.	In all 4.	0		Obstinate constipation in 1 case.	Petechiæ in 2 cases, darkish brown, remained only a few hours.	2	2	0	Diffusible stimulants and alteratives, tonics, counter-irritants.	1 fatal, 30 days. 1 " 40 hours, 1 recovered, 10 days. 1 " 12 days.
Feltonville, in Marlboro', *Middlesex Co.*	1 severe till death; 1 for first 12 hours.	1 only—logical ans.	0	1 case.	Not noticed.						2	0		XXVIII.

NAMES OF TOWNS.	Names of Reporters.	No. of Cases.	Their Dates.	Sources of the Disease.	Locality. High or low, damp or dry.	Districts thickly or sparsely settl'd	Condition of Patients.	Average Age.	Of Adults. Adult Age.	Of Adults. Adv. Age.	Of Adults. Mid. Age.	Adolescence.	Childhood or Infancy.	Greatest Age.	Earliest Age.	Males.	Females.	First case in Town as known by Reporter.	Last case in Town as known by Reporter.	Sporadic or Epidemic.	Cases showing evidence of Contagion.	Average Duration.	Shortest Duration.	Greatest Duration.	Convulsions. No. of cases in which they occurred.
Billerica. *Middlesex Co.*	F. Bundy, M.D.	2	Feb. 26, 1864. Jan. 21, ——.	Both cases followed a sudden cold.	2 low, 1 damp, near a small river.	1 village. 1 house standing alone.	Easy circumstances.	29 yrs.	2		2			36 yrs.	22 yrs	1	1	Feb. 26, 1864.	Jan. 21, 1866.	Sporadic.	0	about 5 ds.	52 h.	8 ds.	0
S. Reading *Middlesex Co.* Lynnfield, *Essex Co.*	C. Jordan, M.D.	2 1	Dec. 4, 1864. Feb. 22, 1865.	Not known.	No preference.	Thickly settled	2 easy, 1 poor.	13 yrs.	1		1		2	21 yrs.	7 yrs.	3		S. Dec. 4, 1864; L. Feb. 22, 1865.		Sporadic.	0	10 ds. 8 h.	36 h.	4 w.	0
Amesbury, *Essex Co.*	Thomas Sparhawk, M.D.	1	July 16, 1865.			Not thickly.	Easy.	2½ yrs.					1	2½ yrs.	2½ yrs.					Sporadic.	0	24 h.	24 h.	24 h.	1 Sometimes confined to one side, or a limb.
Boxford, *Essex Co.* Topsfield, *Essex Co.*	Justin Allen, M.D.	2	March and Nov. 1864.	Nothing definite.	No preference.	Sparsely.	Poor.	5½ yrs.					2	8 yrs.	3 yrs.	2		Mch. '64	T. Mch. '64. B. Nov. '64		0	12 ds.	3 ds.	21 ds.	
Danvers, *Essex Co.*	George Osborn, M.D.	1	Sept. 1864.	Not known.	High land.	Sparsely.	Easy.	26 yrs.	1		1			26 yrs.	26 yrs.	1		Sept. '64	Sept. '64	Sporadic.	0	12 ds.	12 ds.	12 ds.	Clonic spasms, knees drawn up stiffly.
Medfield, *Norfolk Co.*	S. E. Stone, M.D.	1	May 5, 1865.					24 yrs.	1		1			24 yrs.	24 yrs.	1		May 5, 1865.	May 5, 1865.	Sporadic.	0	4 ds.	4 ds.	4 ds.	0
West Roxbury, *Norfolk Co.*	George Faulkner, M.D.	1	March 9, 1864.	Not known.				20 yrs.	1		1			20 yrs.	20 yrs.	1		Mch. 9, 1864.	Mch. 9, 1864.	Sporadic.		12 m.	12 m.	12 m.	1
Roxbury, *Norfolk Co.*	G. J. Arnold, M.D.	1		Not known.	No preference.	No preference.		10 yrs.					1	10 yrs.	10 yrs.		1					Say 42 h.	Say 42 h.	Say 42 h.	1
Walpole, *Norfolk Co.*	Eben Stone, M.D.	1	Dec. 13, 1864.	Sudden cold.	No preference.	No preference.		41 yrs.	1		1			41 yrs.	41 yrs.			Dec. 13, 1864.	Dec. 13, 1864.		0	3 ds.	3 ds.	3 ds.	1 Continued clonic spasms.
Brookline, *Norfolk Co.*	S. Salisbury, M.D.	7	Jan. 4, 7, 14, 18, 20, 21, 29—1866.	Probably impure air.	Low and damp.	Thickly.	Easy.	8½ yrs.					Children ch'lly.	20 yrs.	3 yrs.	2	5	Jan. 4, 1866.	Jan. 29, 1866.	Sporadic.	0	Fatal 48 h. Recov. 10 ds.	8 h.		Not frequent.
Dorchester, *Norfolk Co.*	J. S. Greene, M.D.	1	May 5, 1865.	Patient had played around stagnant water.		Dorchester.		4 yrs.					1	4 yrs.	4 yrs.	1						54 ds.	54 ds.	54 ds.	0
South Weymouth, *Norfolk Co.*	F. F. Forsaith, M.D.	1	June 12, 1863.	Not known.	High land.	Sparsely.	Easy.	3 yrs.					1	3 yrs.	3 yrs.		1	June 12, 1863.	June 12, 1863.		0	7 w.	7 w.	7 w.	1
New Bedford, *Bristol Co.*	J. Henry Jennings, M.D.	2	1864–65.						1				1			?	1								
Fairhaven, *Bristol Co.*	Geo. Atwood, M.D.	6	Feb. to May, 1865.	Not known.	No preference.	Thickly.	Easy.	10 yrs.					Chiefly.	17 yrs.	5 yrs.	5	1	Dec. '64.	May, '65	Doubtful.	0	Say 7 ds.	12 h.	Say 28 ds.	1
Carver, *Plymouth Co.*	Benj Fearing, Jr., M.D.	1	Feb. 1865.	Not known.	Dry.	Sparsely.	Easy.	Say 22 yrs.	1		1			Say 22 yrs.	Say 22 yrs.	1				Sporadic.	0	3 ds.	3 ds.	3 ds.	0
Barnstable, *Barnstable Co.*	H. E. McCollum, M.D.	2	May, 1858.	Supposed contagion or infection. See "Remarks."	No preference.	Sparsely.	Easy.	4 yrs.					2	5 yrs.	3 yrs.	1	1	May, '58	May, '58	Sporadic.	2 ?				0

NAMES OF TOWNS.	Headache. No. of cases in which it occurred.	Delirium. Character of.	Opisthotonos severe.	Opisthotonos slight.	Tenderness at Nucha.	Pulmonary and Pleural Symptoms.	Cardiac.	Abdominal.	Morbid Appearances of the Skin.	Terminat'n. Recov'd.	Terminat'n. Fatal.	Autopsies.	Treatment.	Remarks.
Billerica. *Middlesex Co.*	2 very severe.	Slig[illegible]e, decided in the [illegible]. Mild in both. Logi[illegible]wers in both.	2		Not noticed. But motion caused severe pain in neck in both.	0	In one pulse very variable, in the other unnoticed.		Petechiæ in one, purple, from the size of a pea to that of a cent. Increased in size and became darker. The skin was not raised.		2	[illegible]	XXIX.	In both great tenderness of surface on pressure. In one, severe cramps in limbs and abdomen.
S. Reading *Middlesex Co.* Lynnfield, *Essex Co.*	Severe.	[illegible]stant. [illegible] answers.	0	1	2 cases.		Pulse in one, 50 per min.; in two, 120.		In two cases small purple spots over the body and limbs.	1	2	[illegible]	XXX.	
Amesbury, *Essex Co.*				1	0		Pulse 160.		No petechiæ. Skin mottled after death.		1	[illegible]	Evacuants, ether, then whisky, quinine, beef tea.	
Boxford, *Essex Co.* Topsfield, *Essex Co.*		P[illegible] by unconsciousness.	1	0						1	1	0	XXXI.	
Danvers, *Essex Co.*	1	1 case. Logical answers part of the time.	1			0			Livid, miliary petechiæ, sudamina.		1	0	Cordial, tonic, opiate.	
Medfield, *Norfolk Co.*	Severe.	1 case. Logical answers. Delirium low, quiet.	0	0		Passive congestion of whole of both lungs.	Pulse very feeble, 83.		Petechiæ interspersed with papules resembling urticaria over whole surface. Extensive ecchymoses on both legs and on back.		1	0	Patient seen only in last stage. Stimulants.	
West Roxbury, *Norfolk Co.*	Severe.	Not marked.	0	0	0	0	Not remembered.		Petechiæ over the body on the second day—some as large as a silver three cent piece.		1	0	Supporting and stimulating.	Patient died in one year after months of activity but not of recovery.
Roxbury, *Norfolk Co.*		Almost constant. No logical answers.	1				Pulse not much disturbed		No petechiæ.		1	0		
Walpole, *Norfolk Co.*	1	Delirium and coma.						Vomiting.	No spots.		1	0	Stimulants, opiates, external irritants.	
Brookline, *Norfolk Co.*	Constant and extreme in those who could describe.	Delirium and logical answers in all.	6	1	In all who could describe.	0	Pulse 120 to 130, then 100.	Constipation in all.	Not observed.	4	3	0	XXXII.	XXXII.
Dorchester, *Norfolk Co.*	1	1 case. Logical answers.		1	1		Pulse 100 to 140.	Vomiting.	Bright red spots on neck, chest and abdomen—some as if made by blow from nutmeg grater.	1		0	XXXIII.	
South Weymouth, *Norfolk Co.*	1 severe.	Constant and profound.	1							1		0	Tonics and stimulants.	"Slow recovery after wavering between life and death for three weeks. Head nearly touched the back between the scapulæ."
New Bedford, *Bristol Co.*									Eruption like purpura in both cases.	1	?	0		
Fairhaven, *Bristol Co.*	Say 5.	5 cases. Logical answers.	0	2	4	2	Rheumatic carditis, 2.		Two cases nearly covered with dusky rash in irregular patches, occasionally receding, like roseola.	2	4	0	Tonics, stimulants, nourishment, blister to nucha.	
Carver, *Plymouth Co.*	1	1		1				Nausea.	0		1	0	Cathartic, and blister to nucha.	Right pupil contracted, left one dilated. Death in eight hours from onset of acute symptoms.
Barnstable, *Barnstable Co.*	2	2	0	0	0				Petechiæ about as large as raisins, from 2 to 5 inches apart. Resembled bruises; persisted post-mortem.	1	1	0	Opiates and cataplasms.	It was infection from fomites that was inferred in this case.

NAMES OF TOWNS.	Names of Reporters.	No. of Cases.	Their Dates.	Sources of the Disease.	Locality. High or low, damp or dry.	Districts thickly or sparsely settl'd	Condition of Patients.	Average Age.	Adult Age.	Of Adults. Adv. Age.	Of Adults. Mid. Age.	Adolescence.	Childhood or Infancy.	Greatest Age.	Earliest Age.	Males.	Females.	First case in Town, so far as known by Reporter.	Last case in Town, so far as known by Reporter.	Sporadic or Epidemic.	Cases showing evidence of Contagion.	Average Duration.	Shortest Duration.	Greatest Duration.	Convulsions. No. of cases in which they occurred.
Boston, *Suffolk Co.*	C. E. Ware, M.D.	7	1864–65.	Not known, except that one came from the school at Pittsfield, where so many cases occurred.	None were in the highest parts of the city.	Not crowded.	Easy circumstances.		about half the cases.				about half the cases.	60 yrs.	11 yrs.	3	4			?	0	Fatal 13 d. Recovery 4 w.	10 ds.	5 w.	0
Boston, *Suffolk Co.*	C. E. Buckingham, M.D.	4	Mar. 29, 1864. Apr. 23, " May 6, " Sept. 29, 1865.	In one supposed from malarial exposure—an officer in the artillery.	Tremont, Worcester, Parker and Pleasant Streets—all on a low level.	Not crowded.	Easy.	21 yrs.	2		2	1	1	35 yrs.	5 yrs.	3	1	Mch. 29, 1864.	Sept. 29, 1865.	Sporadic.	0	See "Remarks."	1 fatal less than 24 h.	1 recov. many mos.	In one only, a child.
Boston, *Suffolk Co.*	H. J. Bigelow, M.D.	1	May 2, 1865.	Not known.	High and dry.	Not crowded.	Easy.	23 yrs.	1		1			23 yrs.	23 yrs.		1				0	5 ds.	5 ds.	5 ds.	1
Boston, *Suffolk Co.* Roxbury, *Norfolk Co.*	L. R. Sheldon, M.D.	2 2	1 Apr. 7, 1865. 1 July 20, " 2 Aug. 1, "	Over-fatigue and want of cleanliness and nourishment.	Low and damp.	Thickly.	Poor.	12 yrs.					4		17 ms.	2	2		Aug. '65	Sporadic.	0		2 ds.		4
Boston, *Suffolk Co.*	A. D. Sinclair, M.D.	3	Apr. 30, 1864. May 1, " Jan. 24, 1865.	Not known.	No preference.	Thickly.	Easy.	19 yrs.	1		1		2	46 yrs.	4 yrs.	3		Apr. '64.	Jan. '65.	Sporadic.	0	24 ds.	10 ds.	7 w.	In two cases; 1 severe, 1 slight.
Boston, *Suffolk Co.*	Th. H. Hoskins, M.D.	1	Oct. 2, 1862.	Not known.	Northfield Street; low, not damp.	Not crowded.	Easy.	23 yrs.	1		1			23 yrs.	23 yrs.		1				0	4 ds.	4 ds.	4 ds.	0
Boston, *Suffolk Co.*	W. O. Johnson, M.D.	1	April, 1864.	Not known.	Made land, near Charles River.	Thickly.	Poor.	40 yrs.	1		1			40 yrs.	40 yrs.	1		Apr. '64.	Apr. '64.	Sporadic.	0	4 w.	4 w.	4 w.	1
Boston, *Suffolk Co.*	J. S. Jones, M.D.	3	1865.	No record.					3							3									
Boston, *Suffolk Co.*	Anonymous.	1	Feb. 20, 1864.	Severe cold weather.	High and dry.	Crowded neighborhood.	Poor.	9 yrs.					1	9 yrs.	9 yrs.		1			Sporadic.	0	43 h.	43 h.	43 h.	0
Boston, *Suffolk Co.*	Anonymous.	1	Dec. 1864.	Not known.	Dry.		Easy.	3 yrs.					1	3 yrs.	3 yrs.	1		Dec. '64.	Dec. '64.	Sporadic.	0	4 ds.	4 ds.	4 ds.	1
Boston, *Suffolk Co.*	B. S. Shaw, M.D.	1	July or Aug. 1863.	Traumatic.	High and dry.	Not crowded.		8 yrs.					1	8 yrs.	8 yrs.	1					0	10 ds.	10 ds.	10 ds.	1
Boston, *Suffolk Co.*	William Read, M.D.	1	May 18, 1864.				Easy.	26 yrs.	1		1			26 yrs.	26 yrs.		1				0	about 2½ m.	about 2½ m.	about 2½ m.	No clonic spasms, hands clenched, arms strongly flexed, feet inverted

NAMES OF TOWNS.	Headache. No. of cases in which it occurred.	Delirium. Character of.	Opisthotonos severe.	Opisthotonos slight.	Tenderness at Nucha.	Pulmonary and Pleural Symptoms.	Cardiac.	Abdominal.	Morbid Appearances of the Skin.	Terminat'n. Recov'd.	Terminat'n. Fatal.	Autopsies.	Treatment.	Remarks.
Boston, *Suffolk Co.*	Present, but not a marked feature in any case.	"Violent in some, active in all; only coma in fatal cases."	0	0	Not marked.	Not marked.	Pulse generally frequent, but nothing peculiar about it.	Not prominent, though a little diarrhœa in some of the cases.	Petechiæ distinct in 5 cases. One of the other cases was in the same family with two of these cases, and was evidently the same disease, but no eruption could be discovered.	4	3	0	XXXIV.	3 cases fatal in 10, 12 and 19 days; 4 recovered in from 3 to 5 weeks. XXXIV.
Boston, *Suffolk Co.*	In 3 cases. In the child stupor alternated with convulsions, and headache could not show itself.	In 2 fatal, adult. Logical answers in one until within 12 hours before death. In the other no logical answers for 48 hours before death.	Not recorded	Not recorded	In 2. In one other excessive *pain*.	In all 4 respiration hurried. Pain in 1.	Pulse accelerated in all 4.	Nausea and vomiting a frequent symptom. Diarrhœa in 1 fatal case.	Petechiæ in 3; absent in one of the three fatal cases. They appeared on various parts of the body and extremities. They consisted of small spots as of effused blood, from diameter of cross-quill to that of a lead pencil, distinct, some round, some irregular, and in no case disappearing on pressure. In the case of recovery they became (from purple) gradually a light pink, and gradually passed away.	1	3	0	Opiates, iron, stimulants, broth.	1 case was fatal in 2½ days; one was fatal in less than 24 hours; one in about one week. In the case of recovery it was months. In one case there was obtuse hearing, loss of muscular power. In the case of recovery, rheumatic disease supervened and obscured paralysis of motion, which existed for months.
Boston, *Suffolk Co.*		Present 1 case. Logical answers to a certain extent.	0	0	0	0			Spots in moderate number, chiefly on the lower limbs. 1 case.		1	0		Excessive prostration and sinking from the first.
Boston, *Suffolk Co.* Roxbury, *Norfolk Co.*	4	4	4	0	4	1	Quick and strong.		Spots in all 4. In one case a spot on the hand, another on a foot, a third on abdomen sloughed.	2	2	0	XXXV.	
Boston, *Suffolk Co.*	In 3. Constant back of head especially.	Mild in 3. Logical answers.	1	2	3	In two cases great distress in chest.	Pulse 140 to 150.	Great pain in 2 cases.	0	1	2	0	Quinine, aconite, hydriod. potasse.	
Boston, *Suffolk Co.*	1 severe.	High first day, low muttering second day. Logical answers.	1	0	Not recorded	0	Pulse rapid and bounding at first—strong almost to the last.		1 case. Petechiæ large and numerous.		1	0	Case past treatment when seen.	Dr. Hoskins had another case, seen by another practitioner, among whose cases it has been given already.
Boston, *Suffolk Co.*	1	1 delirious and persistently inattentive; finally comatose.	0	1	0	0	Pulse slow.	0	1 case. Purple ecchymoses on tibia.		1	0	Calomel, purging, opiates, sinapism to nucha.	Tongue white and moist.
Boston, *Suffolk Co.*											3			No record of the cases had been kept.
Boston, *Suffolk Co.*	1 intense.	0	0	0	Not noticed.	0	Pulse 180, very weak.	Vomiting.	Skin "pungently" hot; general mottled look on face and arms. Spots exactly like purpura on limbs and trunk.		1	0	Stimulants, spts. ammon. aromat.	XXXVI.
Boston, *Suffolk Co.*	1 severe. Pain extended down to third or fourth dorsal vertebra.	Slight in one case. Logical answers.		1	1	0	Pulse moderately accelerated.	0	0		1	0	Cathartics, counter-irritants, stimulants, anodynes.	Premonitory symptoms for three days.
Boston, *Suffolk Co.*	1 mild.	Some delirium constantly. Logical answers.		1	0	0	Pulse 130, weak.	0	0		1	0	Stimulants, counter-irritation to neck, cold to head.	The boy fell from a tree and struck his head and spine. Suggestion on treatment: "Experiment and study."
Boston, *Suffolk Co.*	1	Delirium and stupidity. Logical answers in intervals of comparative intelligence.		1	No, but pain between shoulders.	Severe pain through upper part of chest, affecting respiration.	Pulse variable and irregular.	Vomiting; urine involuntary; then catheterism required.	At different dates, purpuric spots on the eyelids, upper part of body and arms. At one time legs and feet purple. Body and legs became dotted with a pustular eruption. Hard inflamed spots like boils, with suppurating apices, interspersed with pustules exactly resembling variola, but which did not dry up into a crust, but became filled with blood and remained so. Finally whole body became covered with boils and abscesses, one of which was opened and gave laudable pus.		1	0	Diffusible and alcoholic stimulants, antispasmodics, opiates, iron, two leeches to temples. No apparent benefit except from stimulants and opiates.	At one time the tongue was protruded a little to the right side. There was deafness, also jactitation.

NAMES OF TOWNS.	Names of Reporters.	No. of Cases.	Their Dates.	Sources of the Disease.	Locality. High or low, damp or dry.	Districts thickly or sparsely settl'd	Condition of Patients.	Average Age.	Adult Age.	Or Adults. Adv. Age.	Or Adults. Mid. Age.	Adolescence.	Childhood or Infancy.	Greatest Age.	Earliest Age.	Males.	Females.	First case in Town, so far as known, by Reporter.	Last case in Town, so far as known, by Reporter.	Sporadic Epidemic.	Cases showing evidence of Contagion.	Average Duration.	Shortest Duration.	Greatest Duration.	Convulsions. No. of cases in which they occurred.
Boston, *Suffolk Co.*	A. A. Gould, M.D.	1	Apr. 6, 1864.		Low and damp, just above and near tide water—U. S. Hotel.	Medium.	Easy circumstances.	26 yrs.	1		1			26 yrs	26 yrs		1			Sporadic.	0	4 ds.	4 ds.	4 ds.	1
Boston, *Suffolk Co.*	S. Cabot, M.D.	2	April, 1864.		Low. 1 Albany St., near U. S. Hotel. 1 in Williams St.	Not crowded.	Easy.	2 yrs.					2	2 yrs.	2 yrs.						0	about 4 w.	about 4 w.	about 4 w.	0
Boston, *Suffolk Co.*	G. Hayward, M.D.	1	Mar. 26, 1864.				Easy.	6 yrs.					1	6 yrs.	6 yrs.	1					0	30 h.	30 h.	30 h.	1 also jactitation.
Boston, *Suffolk Co.*	Calvin Ellis, M.D.	1	Apr. 4, 1864.				Easy.	17 yrs.				1		17 yrs.	17 yrs.	1					0	36 h.	36 h.	36 h.	1
Boston, *Suffolk Co.*	W. E. Coale, M.D.	1	Jan. 27, 1864.				Easy.	14 w.					1	14 w.	14 w.		1				0	23 ds.	23 ds.	23 ds.	0
Boston, *Suffolk Co.*	Calvin G. Page, M.D.	1	Sept. 26, 1865.	Preceded by symptoms of cold, attributable to exposure.			Easy.		1							1					0	14 ds.	14 ds.	14 ds.	0
South Boston, *Suffolk Co.*	J. F. Gould, M.D.	3	June 30, 1864. July 3, " July 17, "	Not known.	High. Soil hard and dry.	All in one house. District not very thickly settled.	Poor.	22 yrs.	1		1	1	1	42 yrs.	7 yrs.		3			Sporadic.	0	9 ds.	4 ds.	3 w.	1
Boston, *Suffolk Co.* [Sent to Mass. Gen. Hos.]	Under care of J. B. S. Jackson, M.D.	1	Feb. 25, 1864.	Not recorded.	Not recorded.	Not recorded.	Easy.	26 yrs.	1		1			26 yrs.	26 yrs.	1					Not recorded	31 ds.	31 ds	31 ds.	1
Boston, *Suffolk Co.* [Sent to Mass. Gen. Hos.]	Under care of A. A. Gould, M.D.	1	Feb. 27, 1864.	Not recorded.	Vine Street—low.	Thickly.	Easy.	17 yrs.				1		17 yrs.	17 yrs.	1					ditto.	23 ds.	23 ds.	23 ds.	1
Boston City Hospital, *Suffolk Co.*	J. N. Borland, M.D.	5	Nov. 5, 1864, to Dec. 3, 1864.			Sparsely.			5		5						5				ditto.	2 fatal in few hs. ca. 1 rec. 4½ m. 1, 5m. 1, 8w.	"a few h."	about 5 m.	In all three of the cases fully described.
Gallop's Island Barracks, Boston Harbor.	Calvin G. Page, M.D. V. Surgeon U. S. Army.	19	1 Sept. 14, 1864. 18 Jan. 23, 1865, to April 11, 1865.	Overcrowding in barracks. Possible contagion in 2.	High and dry.	Over-crowded.	Soldiers.	21 yrs.	6		6	13		40 yrs.	15 yrs.	Soldiers.		Sept. 14, 1864.	Aug. 11, 1865.	Epidemic.	2 ?	about 4½ ds. fatal. 55 ds. recov.	Acute symp 30 min.	about 4 m. recov.	0. But uneasiness or jactitation in a majority.
Fort Warren, Boston Harbor.	Joel Seaverns, M.D. A. A. Surgeon U. S. A.	4	Feb. 26, Mar. 17, Mar. 18, Mar. 23, 1865.	The barracks on Gallop's Island. Patients all recruits from thence.	Low point running into the sea, but not wet by the tide.	Over-crowded while at Gallop's Island. At Fort Warren, as usual in military quarters.	Soldiers.	31 yrs.	3		3	1		45 yrs.	17 yrs.	Soldiers.		Feb. 26, 1855.	Mar. 23, 1865.	Epidemic.	4	11 ds.	12 h.	37 ds	No general convulsions, but much convulsive action in all.

Headache. No. of cases in which it occurred.	Delirium. [illegible]cter of.	Opisthotonos severe.	Opisthotonos slight.	Tenderness at Nucha.	Pulmonary and Pleural Symptoms.	Cardiac.	Abdominal.	Morbid Appearances of the Skin.	Terminat'n. Recov'd.	Terminat'n. Fatal.	Autopsies.	Treatment.	Remarks.
1 intense and continuous.	Bec[illegible] 2[illegible] [illegible]onscious on [illegible]nd never [illegible]after.	No proper opisthotonos, but torsion and rigidity of neck.		Not ascertainable.	Bronchial cough a day or two previous to visit.	Nothing peculiar remembered.		Small, purplish, permanent petechiæ everywhere. Swelling and redness of knuckles.		1	0	XXXVII.	XXXVII.
Not known. Patients too young to manifest. There was shrieking.	Too [illegible] to manifest.	2		2		Pulse not particularly quick.		0		2	0	Hydriod. potassa.	There was convalescence, followed by relapse in both.
1	Los[illegible] [illegible]sciousness.		1		Respiration hurried and labored. Congestion.	Pulse 120—varied in force.	Nausea.	Small, round, purplish dots, increasing in size & numbers, clear and distinct, not raised. On right arm an irreg. shaped blotch like purpura, 1 in. by 1 1-3. Others on body and limbs.		1	0	[illegible]metic—stimulants, hot applications, sinapisms, nourishment.	
1	1						Vomiting.			1	Reported above, p. 56.	Nil. Not under care of Dr. Ellis.	
Not known.	Not known.	1 severe; patient bent to semi-circle.				Pulse 100—regular.	Slight costiveness.	0		1	0	Alteratives, revulsives to spine.	
1	Slight delirium.		1		Coarse rales at base of chest; difficult expectoration.	Pulse variable.	Bowels costive, urine scanty.	Petechiæ abundant on forehead, chest and back.		1	0	Stimulants, quinine, hydriod. pottassa, counter-irritation.	Paralysis of limbs, particularly on the right side; could not feed himself nor turn in bed. Some paralysis of muscles of speech and deglutition.
2 severe. 1 slight.	2 cases. Logical answers in 1.	0	2	2 severe. 1 slight.		3, pulse accelerated.		Petechiæ in 2. In 1 on neck and chest, size of quarter dollar. In the other like flea-bites on body—transient in both.	2	1	0	XXXVIII.	XXXVIII.
1 severe and constant.	Active at first, then mere wandering, from which he could be roused.		?	0	Slight cough, with pain at base of the right lung. No physical signs.	Pulse 100 to 120—full and regular.	Tenderness, costiveness, Ischuria vesicalis.	None recorded.	1		0	XXXIX.	XXXIX.
Pain severe in front part of head, extending to neck and between shoulders.	1. Logical answers.	1		Not recorded	Respiration labored.	Pulse varied in force, and from 88 to 120.	Vomiting. Slight tenderness, retention of urine.	Skin hot and dry; no spots recorded.		1	XL.	Leeching, cathartics, mercury, opiates, and diffusible stimulants.	Attack came on with chills and vomiting. There was deafness and multiplied vision.
Of the 3 cases fully described, 2 severe, 1 slight.	Of 3 cases fully described, and both of them give logical answers.	Of 3 cases fully describ. 2 had severe opisthotonos.	0	Of 3 cases fully describ. 2 had tenderness of, and 1 pain at nucha.	Of 3 cases fully described, 2 had laboured or hurried respiration.	Of 3 cases fully described, in 1 the pulse was 96, in 2 it varied.	Of 3 cases fully describ. constipation in all 3, vomiting in 1	0	3	2	0	XLI.	XLI.
In all the fully developed cases.	In all the fully developed cases but one; in that one, coma. Logical answers generally.	Save in one case, not severe. In 1, *emprosthotonos*. See "Remarks."	In about two thirds of the cases.	Probably in all.	Respiration abnormal in about half the cases.	Pulse generally abnormal.	Nausea or vomiting frequently an early symptom.	Petechiæ very general, though variable in size and sometimes slight. In 1 surface nearly black. In another they sloughed, and were followed by formation of crusts in thin layers, desquamating furfuraceously from the top.	3	16	0 Not allowed.	Tonic and freely stimulant.	XLII.
In all. In some excruciating.	In all. Logical answers in all cases at some times; at other times there was very violent delirium, or occasionally of a low muttering character.		In all 4.	In all 4.	None, except in 1 case. Decided hepatization in one lung in that.	Pulse small, frequent, 100 to 140.	Mercorism in all 4; Diarrhœa with involuntary discharges in 1.	Petechiæ in all 4; in size from a point to qr. in. in diam., of a red, violet or black color, not perceptibly raised—coming on at first invasion and fading out in few days if patient lived so long. Occasion'ly returned in less deg.		4	0 Not allowed.	Quinine and brandy freely, opium and valerian.	XLIII.

RESULTS OF THE TABLES.

Berkshire County.*

The towns from which affirmative replies have been received, are: Adams, 1 case, population 6,924;† Becket, 8 cases, population 1,578; Hinsdale, 1 case, population 1,511; Pittsfield, 5 cases, population 8,045.

No. of above towns,	4
" " towns negatively reported,	5
" " " unheard from,	22
Whole No. of towns in County,	31
Proportion of towns affirmatively reported, to the number of towns in the County, about	$\frac{1}{8}$
No. of cases reported from County,	15
Population of County,	55,120
Proportion of cases reported, to population of County, about	1 in 3,674

Franklin County.

The towns from which affirmative replies have been received, are: Greenfield, 3 cases, population 3,198; Heath, 1 case, pop. 661; Leverett, 1 case, pop. 964; Montague,‡ 1 case, pop. 1,593; Rowe, 1 case, pop. 619; Shutesbury, 1 case, pop. 798.

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* Dr. Babbitt, of the Committee, writes (since these calculations were completed) that there is but little knowledge of the disease in the County; but reports two additional cases in the hands of an irregular practitioner in Adams.

† The statements of population are on the basis of the census of 1860.

‡ Five additional cases in Montague in 1864, reported since these calculations were made, will be given hereafter.

No. of above towns,	6
" " towns negatively reported,	4
" " " unheard from,	16
	26
Proportion of towns affirmatively reported, to whole No. of towns in County, between	$\frac{1}{4}$ and $\frac{1}{5}$
No. of cases reported from County,	8
Population of County,	31,434
Proportion of cases reported, to population of County, as	1 in 3,929

Hampshire County.*

The towns from which affirmative replies have been received, are: Amherst, 1 case, pop. 3,206; Belchertown, 3 cases, pop. 2,709; Granby, 12 cases, pop. 907; Greenwich, 7 cases, pop. 699; Northampton, 6 cases, pop. 6,788; Prescott, 1 case, pop. 611; Williamsburg, 1 case, pop. 2,095.

No. of above towns,	7
Indirectly reported (Hadley) affirmative,	1
	8
No. of towns negatively reported,	2
" " " unheard from,	13
	23
Proportion of towns affirmatively reported, to the whole No. of towns in the County, about	$\frac{1}{3}$
No. of cases directly reported from County,	31
Population of County,	37,823
Proportion of cases reported, to population of County,	as 1 in 1,220

* Four cases were received May 25, 1866 (after the completion of the report), which occurred in South Hadley and Granby, December, 1864, March, 1865, and January, 1866. See Appendix.

Hampden County.

The towns from which affirmative replies have been received, are: Monson, 5 cases, pop. 3,164; Palmer, 20 cases, pop. 4,082; Springfield, 11 cases, pop. 15,199; Westfield, 41 cases, pop. 5,055; Ludlow, 1 case, pop. 1,174.

No. of above towns,	5
Indirectly reported (Russell) affirmative,	1
	6
No. of towns negatively reported,	4
" " " unheard from,	11
	21
Proportion of towns affirmatively reported, to whole No. of towns in County, between	$\frac{1}{3}$ and $\frac{1}{4}$
No. of cases directly reported from County,	78
Population of County,	57,366
Proportion of cases reported, to population of County, as	1 in 735

Worcester County.

The towns from which affirmative replies have been received, are: Athol, 6 cases, pop. 2,604; Barre, 1 case, pop. 2,973; Brookfield, including East Brookfield, 2 cases, pop. 2,276; Dana, 1 case, pop. 876; Fitchburg, 1 case, pop. 7,805; Hardwick, 9 cases, pop. 1,521; Leicester, 1 case, pop. 2,748; Leominster, 1 case, pop. 3,522; New Braintree, 2 cases, pop. 805; North Brookfield, 1 case, pop. 2,760; Oakham, 2 cases, pop. 959; Petersham, 4 cases, pop. 1,465; Sutton, 1 case, pop. 2,676; Upton, 2 cases, pop. 1,986; Westminster, 1 case, pop. 1,840; Worcester, 6 cases, pop. 24,960.

No. of above towns,	16
" " towns negatively reported,	16
" " " unheard from,	26
	58

Proportion of towns affirmatively reported, to whole No. of towns in County, between	$\frac{1}{3}$ and $\frac{1}{4}$
No. of cases reported from County,	41
Population of County,	159,659
Proportion of cases reported, to population of County, as	1 in 3,894

Middlesex County.

The towns from which affirmative replies have been received, are: Billerica, 2 cases, pop. 1,776; Cambridge, including East Cambridge, 5 cases, pop. 26,060; Charlestown, 2 cases, pop. 25,065; Marlborough, 2 cases, pop. 5,911; South Reading, 2 cases, pop. 3,207; Somerville, 2 cases, pop. 8,025.

No. of above towns,	6
" " towns negatively reported,	32
Doubtful report from Framingham,	1
Towns unheard from,	13
	52
Proportion of towns affirmatively reported, to whole number of towns, about	$\frac{1}{9}$
No. of cases reported from County,	15
Population of County,	216,354
Proportion of cases reported, to population of County, as	1 to 14,423

Essex County.

The towns from which affirmative replies have been received, are: Amesbury, 1 case, pop. 3,877; Boxford, 1 case, pop. 1,020; Danvers, 1 case, pop. 5,110; Lynnfield, 1 case, pop. 866; Topsfield, 1 case, pop. 1,292.

No. of above towns,	5
Indirectly reported affirmative, by Georgetown,	1
	6
Doubtfully reported, Haverhill,	1

No. of towns negatively reported,	17
" " " unheard from,	10
	34
Proportion of towns affirmatively reported, to whole number of towns in County, between $\frac{1}{5}$ and $\frac{1}{6}$	
No. of cases *directly* reported from County,	5
Population of County,	165,611
Proportion of cases reported, to population of County, as	1 in 33,122

Norfolk County.

The towns from which affirmative replies have been received (excluding Brookline, with 7 cases occurring in 1866), are: Dorchester, 1 case, pop. 9,769; *Medfield*, 1 case, pop. 1,082; Roxbury, 3 cases, pop. 25,137; Walpole, 1 case, pop. 2,037; West Roxbury, 1 case, pop., 6,310; Weymouth, 1 case, pop. 7,742.

No. of above towns,	6
" " towns negatively reported,	13
" " " doubtfully " (Needham)	1
Towns unheard from,	3
	23
Proportion of towns affirmatively reported, to whole number of towns in County, between $\frac{1}{3}$ and $\frac{1}{4}$	
No. of cases reported from County,	8
Population of County,	109,950
Proportion of cases reported, to population of County, as	1 in 13,744

Bristol County.

The towns from which affirmative replies have been received, are: Fairhaven, 6 cases, pop. 3,118; New Bedford, 2 cases, pop. 22,300.

No of above towns,	2
" " towns negatively reported,	7

No. of towns unheard from,	11
	20
Proportion of towns affirmatively reported, to whole number of towns in County,	$\frac{1}{10}$
No. of cases reported from County,	8
Population of County,	93,794
Proportion of cases reported, to population of County, as	1 in 11,724

Plymouth County.

The only town from which an affirmative reply has been received is Carver, 1 case, pop. 1,186.

No. of above	1
No. of towns negatively reported,	17
" " " unheard from,	7
	25
Proportion of towns affirmatively reported, to whole number of towns in County,	$\frac{1}{25}$
No. of cases reported from County,	1
Population of County,	64,768

Dukes County.

Towns affirmatively reported,	0
" negatively "	2
" unheard from,	2
Population of County,	4,403

Nantucket County.

Reply negative. Population,	6,094

Barnstable County.

The only town from which an affirmative reply has been received, is Barnstable, 2 cases, pop. 5,129.

No. of above,	1
" " towns negatively reported,	7
" " " unheard from,	5
	13
Proportion of towns affirmatively reported, to whole number of towns in the County,	$\frac{1}{13}$
No. of cases reported from County,	2
Population of County,	35,990
Proportion of cases reported, to population of County, as	1 in 17,995

Suffolk County.

The only town from which an affirmative reply has been received, is Boston, 43 cases, pop. 177,840.

No. of above,	1
" " towns negatively reported,	2
" " " unheard from (N. Chelsea, pop. 921),	1
	4
Proportion of towns affirmatively reported, to whole number of towns in County,	$\frac{1}{4}$
No. of cases reported from County,	43
Population of County,	192,700
Proportion of cases affirmatively reported, to population of County, as	1 in 4,481

In the State of Massachusetts,

The number of *towns* from which affirmative replies have been received previously to January 1, 1866,* including those *indirectly* reported, is 63

No. of towns negatively reported,	129
" " " doubtfully "	3
" " " unheard from,	140
	335

* Brookline, in Norfolk County, is excluded because its cases occurred in 1866, while the reports from other towns came in during the previous year.

Proportion of towns affirmatively reported to whole number of towns in the State, is very nearly 19 per centum, or about	$\frac{1}{5}$
No. of cases reported from all the *towns* of the State, *except Brookline,**	255
Population of State,	1,231,066
Proportion of cases reported (as above) to population of State, as	1 in 4,827
Population of State, 1,231,066; *minus* population of Suffolk County, 192,700	=1,038,366
Cases in the State as above, 255; *minus* 43 cases in Suffolk County	=212
Proportion of cases in the State previous to January 1, 1866, excluding those in Suffolk County, to the population of the State, excluding that of Suffolk County, about as 1 in 4,898 (1,038,366 ÷ 212.)	

Total number of cases in the *towns* of the State up to January 1, 1866,	255
Cases in Brookline, Norfolk Co., January 1, 1866,	7
Cases in Boston Harbor, Gallop's Island,	19
Fort Warren,	4
Fort Independence, etc.,	0
	285
Cases in Whitingham, Vermont,	2
Total number of cases in the tables,	287

We will state here, that besides the affirmative replies from Suffolk County, recorded in the above tables, there were 108 negative answers from that County.

* See note on page 73.

SOME GENERAL RESULTS OF THE PRECEDING STATISTICS.

The present epidemic in Worcester County is represented by a number of the same towns in which the epidemic of 1806 to 1815 occurred. The town of Dana, where the last mentioned began in that County, had one case in 1864. Both epidemics, also, rested upon the towns of Petersham, Barre, Oakham, Hardwick, New Braintree, Brookfield, Athol, Leicester, and Worcester. "Gerry," mentioned in the account of the old epidemic, is now an obsolete name. Paxton, Rutland, Spencer, Sturbridge, and Winchendon, sufferers in the old, do not appear in the present epidemic.

Medfield, in Norfolk County, historical as the first starting point of the "old spotted fever," is represented by one case in 1865. In Cambridge, Middlesex County, the present epidemic has differed from the old, in that it has not selected the marshy portions of Cambridgeport.

It is, perhaps, worthy of mention, that Middlesex County, though in great part inland, does not seem to have suffered much in the old epidemic, and has felt the present one but lightly.

In reviewing the foregoing statistics, it strikes us that there is not a material difference between the proportion of cases to population in Suffolk County, and the proportion of cases to population in the rest of the State. As Suffolk County means Boston, and its more immmediate suburbs—the latter peopled much in the same manner as itself—we learn from the above fact, that the disease in question has not sought out the metropolis especially for its ravages. On the contrary, inspection shows us that the places where the malady has dealt its heaviest blows, are the country towns of the interior of the State; as, for instance, in

Hampden County, where the ratio of cases is 1 to 735 inhabitants, while that of Suffolk County is 1 to 4,481. Or, again, contrast the ratio of Boston alone (1 to 4,136) with that of the town of Westfield, in Hampden County, which is 1 in 123; the number of cases in the city with its 177,840 inhabitants being 43, while that of the country town with its 5,055 inhabitants is 41. Another less striking instance is that of Palmer with its 20 cases among 4,082 inhabitants, or 1 in 204.

The ratio of Suffolk County, however, is much greater than that of the other eastern Counties, not diverging very widely from the ratio of the inland County of Worcester.

A survey of the statistics of the different Counties *inter se*, from west to east, gives the following results. We begin at Berkshire County, with a moderate figure—1 in 3,674, and meet a ratio in Franklin County, which as entered in the tables, was 1 in 3,929. This ratio has been raised by the reception of 5 additional cases from Montague to 1 in 2,418. In Hampshire County—next south of Franklin—the ratio rises to 1 in 1,220; and in Hampden County, next south of Hampshire, to 1 in 735. These three last-mentioned Counties form the eastern border of Berkshire. Bounding them, on the east lies the large County of Worcester, in which the ratio corresponds more nearly with that of Berkshire County, being 1 in 3,894. Passing to the east, we reach the eastern Counties, all of which touch the waters of the Atlantic at one or more points. In these, the ratio drops abruptly, being in Middlesex 1 in 14,423. Yet Middlesex is more thoroughly reported than most Counties.

In Norfolk County the ratio is not far from that of Middlesex, being 1 in 13,744. In Essex County, lying largely upon the sea, the ratio drops again to 1 in 33,122. In Bristol County, touching the ocean only on its southern border, it rises to the neighborhood of that of Norfolk, which has about an equivalent Atlantic exposure. In Plymouth County, with some three-fourths of its boundary consisting of sea-shore, the ratio drops to 1 in 64,768.

In Dukes, Nantucket, and Barnstable Counties, all well

out at sea, the replies are, for the two former, no cases; for the last, 2 cases—or 1 in 35,990.

It happens, then, that so far as our reports inform us, the eastern Counties have had, according to their population, less of the disease than the others; and have felt it just about in an inverse proportion to their exposure to the sea.

Does Proximity to bodies of Fresh Water favor the Invasion of the Disease?

Glancing at the map of the State to see if any of its other features may be associated with the special prevalence of the disease, the eye falls upon the Connecticut River, to find it traversing the three Counties having the largest proportion of cases reported. We look to Westfield with its heavy list of 41 cases, and see it cut in halves by the Westfield River, near its junction with the Connecticut. We see Springfield on the opposite bank of the principal river, with its smaller proportion of 11 cases in 15,199 inhabitants; Granby, a little further north, and about as far from the Connecticut as Westfield, showing 12 cases in 907 inhabitants; Northampton, on the west bank of the river, having 6 cases in 6,788 inhabitants. Thence proceeding up the river, we find the towns which are reported (several are not) having single cases till we come to where the Deerfield river joins the Connecticut, much in the same manner as the Westfield river makes its junction. We observe that our reports show no such collection of cases at this spot as at the point of union of the Westfield river with the principal stream. We find at this point only four cases—three in Greenfield and one in Montague. But, while writing this paragraph, a long delayed "circular" comes in from Montague with five additional cases in that town, and containing the statement that the disease had prevailed as an epidemic in the surrounding towns.* Many of the most

* The Circular arrived too late to be inserted in the tables, but it does not materially affect their general results, except to strengthen the conclusions already drawn, that the inland Counties have been more visited by the disease than the Eastern. We shall give a report of the cases in a suitable place.

affected towns at a considerable distance from the Connecticut are watered by its tributaries. Taking these things in connection with the statements of Dr. Terry, as to the *endemic* (as we have called it) in Sutton and Millbury, in 1849, that the whole region over which it extended has "a soil very retentive of moisture, and a damp atmosphere;" while in Millbury most of the cases occurred within a few rods of the Blackstone River, which also skirts the town of Sutton; taking these things together, we have a *prima facie* case that in exposure to moisture, or proximity to bodies of fresh water, may be found one of the causes of the disease. But, let us not jump at conclusions. We have to lament that we are without full reports of the places where the disease was *not*, as well as those where it *was*. And a reliable induction upon this point cannot be made without a thorough comparison of the two classes of places.

A good illustration of the difficulty attending an investigation of this subject occurs in the circumstances of the town of Palmer. In that place, in which there were twenty cases, three rivers meet, giving the name "Three Rivers" to one of its villages. Here, then, we might be tempted to draw an inference as to the connection of the disease with emanations from the water. But, in reply to inquiries from us, Dr. Holbrook, of Palmer, writes that the part of the town "most afflicted with meningitis is very dry. The soil is of a sandy, gravelly nature, and twenty-four hours after a long or hard storm, the dust will fill the eyes." * * * "The Quaboag River is not more than a quarter of a mile from our village—an eighth of a mile would perhaps be nearer the distance. But it is quite rapid—no stagnant water—no dams within two miles of us." * * * There was, Dr. H. adds, one case in Thorndike Village, one also in Three Rivers Village; both about three miles from the district where a large majority of the cases occurred.

Of Westfield itself, also, Dr. George G. Tucker, of that place, remarks, that there is in it "no standing water or marshy ground—every thing in good sanitary condition—

even ready for the cholera. The site of Westfield is, according to geological suggestions, the bed of a former lake, six miles long and three broad. Surrounded on all sides by hills, except for a short distance on the south-east, where this body of water was supposed to have its outlet, and although its situation is low compared with its immediate surroundings, it is *not* so as compared with the level of the sea; and the air is as dry as that of the most elevated tracts."

On the other hand, Dr. Tucker says, in another place, the month of February, 1857, in which the disease broke out in Westfield, was exceeding mild, and the atmosphere for the most part filled with vapor.

Portion of the State most affected not that of the greatest "Rain-fall."

One thing it is easy to determine—that is, the region most infested by the disease, so far as our reporters inform us, is not that of the greatest "Rain-Fall," but of the second and third degrees in the descending scale.

We here take leave of the geography of the disease, and proceed to a brief notice of the

Dates of the Cases.

The first cases reported to us, are two in Becket, Berkshire County, in April, 1857. Another case occurred in that town in October of the same year. This was followed by five, between the 6th and 14th of March, 1858.

The disease broke out with violence in Westfield, Hampden County, in January, 1858, and prevailed there again in 1859; also from 1861 to 1865. Instances have occurred in this State, in each year, from 1857 to 1866, inclusive, with the exception of 1860, which is not mentioned in any of our reports.

It needs but a cursory survey of the tables to show that the disease, in this Commonwealth, did not follow, from year to

year, any regular course, relatively to the points of the compass, but fell upon different spots, here and there, without apparent order—sometimes retracing its steps.

The distribution of the cases in the State over the different *years* of the epidemic is as follows, viz.:

In 1857 there were	3	cases.
" 1858 " "	27	"
" 1859 " "	3	"
" 1860 " "	0	"
" 1861 " "	5	"
" 1862 " "	5	"
" 1863 " "	7	"
" 1864 " "	88	"
" 1865 " "	116	"
It was also stated that "from 1864 to 1865" there were	15	"
"from 1861 to 1865" there were	8	"
The years were not mentioned as to	3	"
	280	"
As we have, of course, no full accounts for the present year, the cases in Brookline, in January, 1866, are not to be counted in. They amounted to	7	"
	287	"

The *months* in which the cases occurred are given as follows, viz.:

January,	21	cases.	July,	8	cases.
February,	25	"	August,	4	"
March,	37	"	September,	4	"
April,	30	"	October,	5	"
May,	14	"	November,	2	"
June,	5	"	December,	8	"
				163	"

January to April,	18	cases.
February to May,	6	"
February to April,	20	"
February to March,	9	"
March and April,	2	"
"Winter and Spring,"	8	"
February to July,	4	"
"July or August,"	1	"
November to December,	5	"
	236	"
Not mentioned,	51	"
	287	"

Now, if we take the first of the above lists—that in which the number of cases is specified for each month separately—we find that the number of cases set down to the first *five* months of the year amounts in the aggregate to 127; while those which occurred in the remaining *seven* months number only 36. May has a much lower number than either of the preceding four months.

In the second list, also, the cases representing exclusively the first five months amount to 55; while those stated as occurring in "July or August," and in November and December, number only 6.

November and December, it will be noticed, though averaging as great an amount of cold weather as any of the other months, are among those with small representation of cases.

But, the months mentioned as giving the bulk of the cases are those in which there is much alternate freezing and thawing; and consequently much *cold combined with moisture.*

Meteorology.

As to the meteorology of the past nine years, which cover the period of the present epidemic in this State, we are not aware of any thing unusual to be recorded of it. On the contrary there has been, as to the weather, the *ordinary diversity,* from year to year, characteristic of this climate.

Sources of the Disease.

The *sources* to which the disease is ascribed by our correspondents are—

Probable or possible contagion, in cases	16
Variously otherwise specified in the tables, in cases	75
"Not known," in cases	152
Not mentioned, " "	44
	287

Locality—High or Low, Damp or Dry.

The *locality* of the disease, as to *level*, was not mentioned in	37	cases.	
Not definitely stated in	7	"	
Medium in	1	"	45
No preference for high or low was shown in	143	"	
The locality was high in	58	"	
" " " low in	41	"	
	242	"	242
			287

The *dryness* or *dampness* of the "locality" of the disease was *not mentioned* in		52 cases.
leaving 235 cases.		
Of these there was said to be *no preference* in	147 cases.	
The locality was *dry* in	60 "	
" " " *damp* in	28 "	
	235 "	235 "
		287 "

Occurrence of the Cases in Districts Thickly or Sparsely settled.

The term "thickly settled" varies its meaning so much under different circumstances—particularly as between the city and the country—that we have divided our cases under the above caption into three divisions—the first composed of those among the military on the Islands in Boston harbor, numbering 23

The second embracing those in the City of Boston (including South Boston), =43

The third, taking in all in the remainder of the State, =221

287

In *Boston harbor* there were 19 cases at Gallop's Island—"over-crowded;" 4 at Fort Warren, which went from Gallop's Island, and were, while at Fort Warren, "as usual in military quarters," i. e. *crowded;* in all 23

In *Boston*, there were, in a district "not very thickly settled" (in South Boston), cases 3

(In City Hospital,) ditto,	"sparsely,"	"	5
"	"medium,"	"	1
"	"not crowded,"	"	16
"	"thickly,"	"	7
"	"crowded,"	"	1
Settlement of district not mentioned,		"	10
			43

In comparing these 43 cases *inter se*, we exclude those whose localities are "not mentioned" (10); and also, as bearing on neither side, the case (1) designated as occupying a "medium" locality, together with 3 in a part of South Boston "not very thickly settled"; making in all, 14; and leaving (of the 43) 29 to be reckoned upon. Of these 29, their locality is given as

"Sparsely" settled in 5

"Not crowded," i. e., the better class of city streets, 16

21

Against these 21 cases we set off, as in "thickly" settled districts, 7, "crowded," 1=8. This gives us between two and three times as many cases in the *less* thickly settled parts of the City of Boston, as there were in the thickly settled or crowded portions (21 to 8).

On the *main land outside of Suffolk County*, the cases are 221 in number, and are classified as follows, viz. :

Cases in which settlement of locality is not mentioned,	10	
Cases indefinitely described,	1	
Do. "medium,"	6	
Case in "Dorchester,"	1	—18
Excluding the above 18, we have left 203; of these there was as to locality "no preference" in cases	99	
There were in places "thickly" settled,	26	
" " " " "rather thickly settled for country town,"	3	
" " " " "sparsely" settled,	74	
" " " a "village,"	1	—203
		221

Of the above 203 cases, 99, or nearly one-half, showed "no preference" in their choice of locality whether "thickly" or "sparsely" settled. Of the remaining 104 cases, 26 were in places set down as "thickly" settled; and 3 in a place "rather thickly settled for a country town," =29 cases. Against these we set off 74 cases in a "sparsely" settled region, and 1 in a "village" =75.

Thus we have between two and three times as many cases in the "sparsely" settled as in the "thickly" settled localities. This result tallies closely with that in Boston.

Now taking our three divisions of the State together, we have in Boston harbor,

In "over-crowded" barracks,	cases	19
In ordinary military quarters,	"	4—23

In thickly settled quarters of Boston (no other towns of Suffolk Co. being affected)	"		8
On the main-land, outside of Suffolk Co., in more or less thickly settled localities,	"		29
			60
In the less thickly settled parts of Boston,	"	21	
In the less thickly settled regions of the remainder of the State,	"	75—96	

We thus get a majority of 36, out of 96 cases throughout the State, in favor of the less thickly settled regions.

To confront the question of the distribution of the cases from another point of view—that is, as between the Metropolis and the rest of the State—we have only to repeat, what we have already deduced from previous statistics, that there is not a material difference between the proportion of cases to population in Suffolk County, and the proportion of cases to population in the remainder of the Commonwealth.

These facts bear, as will be hereafter seen, upon the pathology of the disease.

Condition of Patients.

In asking the questions, "How many were in easy or comfortable circumstances?" and "How many were poor?" we include in the former category all who were not subjected to privation. These questions were not answered as to

	cases		34
Leaving 253.			
There were in the Almshouse at Monson,	"	2	
At the Boston City Hospital,	"	5	
Soldiers in Barracks,	"	23	
In easy or comfortable circumstances,	"	89	
Poor,	"	26	
There was "no preference" in	"	108—253	
			287

In recording the *ages* of the cases, we have, acting by advice, made an arbitrary division of them; as follows, viz. :—

Under 15 years, we call "Infancy or Childhood;" from 15 to 20, "Adolescence;" from 20 to 50 "Middle age;" from 50 upwards, "Advanced age."

Ages.

In taking account of the ages, we exclude cases in which the age is *not mentioned*,		4	
Also cases in which the age is *not definitely mentioned*,		5	
Cases stated to be "about half of them children and half adults,"		18	
* *Soldiers* of middle age,		9	
" in adolescence		14	—50
This leaves us 237 cases, out of which we have, as *explicitly reported*,			
In "Infancy or Childhood,"	79		
In Adolescence,	12		
Adults,	67	—158	
showing a preponderance of 24 cases in the two earlier periods of life over those of adult life. This preponderance is strengthened by the following statement, viz. :— There were "chiefly children" in cases	44		
Of a group consisting of children and youths there were "chiefly children." The group consisted of	4		
There were "young lads mostly" in cases	16	—64	
There were chiefly "adults" in "		15	—237
			287
It remains to say that of the adults numbering (still exclusive of the soldiers) 67,			
The exact age was not mentioned in	cases	17	
The age was "advanced" in	"	4	
The patients were of "middle age" in	"	38	

* Soldiers are excluded as being of *selected* age.

The subjects were chiefly of "middle age" in cases 8—67

Among the "*greatest ages*" we find one subject to have been of 72 years—another of 65 years; among the earliest ages, two of four months each, and one of five months. No period of life was exempt.

Sex.

The *sex* was not mentioned in	cases	29	
The subjects were soldiers in barracks in	"	23	
		52	
We therefore exclude cases			52
The male sex was represented in	"		131
" female " " " "	"		88
This gives us a preponderance of nearly 60 per centum of males over females.			
This preponderance is increased by a group of 16 cases "mostly lads,"			16
			287

"Sporadic or Epidemic."

There was no entry under this heading in	cases	32	
The replies were "doubtful" in	"	13	—45
The term "Sporadic" was applied to	"	131	
" " "Epidemic" " " "	"	111	—242
			287

Although the larger number of the cases competent to be reckoned upon were considered by their reporters as sporadic, we presume the whole 287, taken together as for the State, may be regarded as constituting an *epidemic*.

Contagion.

The question "were there evidences of contagion?" was not answered in cases 19

leaving 268 cases to be reckoned.

It was answered affirmatively three times,		
i. e., by one reporter as to	cases 5	
by another as to	" 1	
by a third as to	" 4—10	
There were coincidences pointing to contagion in three other reports, together comprising cases numbering		6
Thus out of 268 cases in which the point was mentioned, the answers were negative as to		252—268
		287

In relation to the 16 cases above-mentioned as more or less suggestive of contagion, we proceed to show the evidence.

Two of the "doubtful" cases are in the report of Dr. Page concerning the epidemic at Gallop's Island. One of them was that of a physician who attended a case of "Spotted Fever" previously to going to the Island. The other was that of a recruit who occupied the bed previously used by another patient who had had the disease. No comments were made by Dr. Page upon these facts; and we give the evidence as it stands.

Dr. Seaverns answers affirmatively to the question of contagion as to the 4 cases at Fort Warren; saying they "all occurred in the same barrack, and all came from a place [Gallop's Island] where there had been cases previously."

In 2 cases the reporter of them gives it as his opinion that the disease was contagious from what he had seen of it previously, but does not appear in his letter to show evidence for it in these particular cases.

In two other cases the reporter answers negatively to the question whether or not there were evidences of contagion, but adds, "it would seem as though the children took it [the disease] from the father, or the same cause operated to produce it in all three."

In six cases in Northampton, Dr. Thompson thinks five were all "causatively connected by contagion" with the first case—a stranger who imported the disease. There were, he says, "six cases in two families—locations apart and dif-

ferent. The first patient in the second house had had contact with the first in the other (i. e., the stranger woman) at a manufactory, away from either dwelling. In one of the houses three families lived separately. Three cases in one of the three families—no one else sick under that roof."

The remaining case answered in the affirmative was one where the patient—a physician—had visited a case of the same affection two weeks previously. (Vide cases of Dr. David Rice.)

We have presented the evidence as to these cases of contagion alleged or suggested. The writer, speaking for himself alone, sees in most of them, coincidences, but is not satisfied that the "causative connection" is proved in any of them. The four cases in soldiers who went from Gallop's Island to Fort Warren, we would submit, may have gone with the seeds of the disease in them. And it is to be noted that they did not communicate it to others in the garrison.

Duration.

As to the duration of the disease our tables give us comparatively few cases in which it is specified for each case; and so great is the diversity in the length of the cases (taking the deaths with the recoveries) that a general average would throw little light on the behavior of the disease in this respect. We have, however, drawn off the durations of the single fatal cases, and single cases of recovery; and also, the "average durations" of the groups of cases which were all fatal; and, separately, those of the groups which all terminated in recovery, as follows, viz.:—

Fatal Cases—Duration.

Average duration.	Cases.	Average duration.	Cases.	Average duration.	Cases.
Less than 3 days	8	12 *months*	1	2½ months Relapse?	1
5 days	1	24 hours	1	4 days	1
36 hours	1	12 days	1	23 days	1
about 4 days	7	4 days	1	4 weeks	2
25 hours	2	42 hours	1	30 hours	1
39 hours	5	3 days	1	36 hours	1
31 hours	1	48 hours	3	14 days	1
about 18 days	4	3 days	1	23 days	1
2 days	2	13 days	3	11 days	4
6 weeks	1	2½ days	1	a few hours	2
3½ days	1	Less than 24 hours	1		—
36 hours	2	about 1 week	1		15
about 5 days	2	5 days	1		
10 days	2	4 weeks	1		
	—	43 hours	1		
	39	4 days	1		
		10 days	1		22
		4 days	1		39
			—		—
			22		76

Fatal cases at Gallop's Island, deduced from published report.

Duration.	Cases.	Duration.	Cases.	
5 days	1	2 days	1	
2 days	1	19 days	1	
2 days	1	8 days	1	
30 *minutes*	1	18 days	1	
1 day	1	2 days	1	
2 days	1	12 hours	1	
14 hours	1	4 days	1	
1 day	1	3 days	1	
	—		—	
	8		8	=16
				—
				92

Additional fatal cases obtained from inspection of the Circulars, and not distinguishable in the tables.

30 days,	1 case	1
"a few hours,"	1 case	1
4 days,	1 case	1
		—
Fatal cases, total		=95

We have, in the above lists, 66 cases in which the result was fatal, and in which the duration, or the average duration, was 5 days or *under;* 1 fatal case of 8 days duration; and 28 fatal cases, the duration, or the average duration of which, was 10 days or *over*.

Of the "12 months" fatal case in the preceding list (Dr. Faulkner's), the reporter says—"the patient died in one year, after months of activity, but not of recovery." This is the longest *fatal* case we have as yet met with. Our list also contains the shortest case we have seen on record, whether among fatal cases, or recoveries—30 *minutes* from the acute attack. The patient, however, had vomited, a few hours previously, from, as it was supposed, an overloaded stomach.

Cases of Recovery—Duration.

Average duration.	Cases.	Average duration.	Cases.	
3 weeks	4	10 days	4	
2 weeks	1	54 days	1	
3 weeks	6	7 weeks	1	
2 weeks	1	"Say" 4 weeks	4	
4 weeks	2	"Many months"	1	
		31 days	1	
8 *hours*	1	4½ months	1	
45 days	1	5 months	1	
2 months	3	8 weeks	1	
8 weeks to convalescence, 1 year to full health	1		— 15	
About 7 weeks	2	3 weeks+	1	From Gallop's Island.
		11 weeks+	1	
		26 days+	1	
	— 22		— 18	

Additional cases of recovery obtained from inspection of the Circulars, and not distinguishable in the tables.

Average duration.	Cases.	Average duration.	Cases.
1 week	1	3 weeks, acute stage, recovery protracted further,	3
3 weeks	1		
	— 2		

2+3=5 cases.

Duration discriminated in		
Cases of recovery	22+18+5=	Total, 45
Fatal cases (bro't over from p. 90)		" 95
Cases in which the duration was not discriminated for fatal cases and those of recovery,		147
		287

The eight hours case in the list of recoveries was 8 hours *under the acute attack;* after which, we are told, the convalescence was rapid. It was interesting as having been treated after the manner of sun-stroke in India; and in being as exceptional in its brevity *for a case of recovery,* as the twelve months *fatal* case was for its length.

In the vast majority of the cases of *recovery* given above, the duration of them may be stated in weeks and months; while in a large majority, more than 2 to 1, of the fatal cases, the duration was of days or hours.

In some of the statements the average duration was given as approximative; but, in all, we presume with sufficient accuracy for practical purposes.

Relapses.

Besides the case of relapse of Dr. Faulkner, fatal at the end of a year, there were among the cases of Dr. Holland, of Westfield, 5 relapses, three of which were fatal. There were relapses also in both the cases, fatal, of Dr. Cabot, of Boston; in three (which recovered) of Dr. Borland's cases at the City Hospital in Boston; in some or all of the cases of Dr. Seaverns, at Fort Warren, all of which were fatal.

Since no question was put, in the circulars, as to relapses, that event may have occurred in others of the cases in the tables without our being cognizant of it.

Convulsions

were not mentioned in cases		36
leaving 251 cases to be accounted for.		
Of these the symptom was absent in cases	123	
" " " " was not frequent in cases	7	
	130	
It was present in "	72	
There was much convulsive action in "	4	
"Spasmodic action" was frequent in "	16	
Convulsions were "a frequent occurrence" "	18	
There were ditto in "most" of a group of "	9	
" " cramps in the arms and hands in "	1	
Hands clenched in "	1—251	
		287

We may estimate that convulsive action, in one form or another, was present in considerably less than half the cases in which the symptom was mentioned.

Headache

was not mentioned, or was not ascertained—as where patients were unconscious, " " " as where patients were too young,	in cases	25
This leaves 262 cases to be accounted for.		
Of these it was *present* in cases	191	
" " " " "frequent" " "	16	
It was present "in every case in which the sufferer could describe his sensations," in groups consisting of "	24	
Present "in all fully developed cases," of a group of	19	
	250	
It was *absent* in cases	3	

"Several complained of severe headache, others but little," in a group composed of cases	9—262
	287

Thus, we may say headache was present in a vast majority of the cases in which the symptom was mentioned, or its presence or absence could be ascertained. In the three cases in which it was stated that it was absent, we are left in the dark as to the circumstances—whether, for instance, the patient were conscious or not. In no *fully developed case* are we distinctly told that the patient was conscious of sensation, and yet free from pain in the head.

When the degree of the headache is mentioned, it is sometimes said to be mild; more often severe; by one observer, "*terrible;*" by another, "excruciating."

In 19 cases the part of the head affected was mentioned. In 10 the pain was in the back part of the head; in 3, in the "back part especially." In 6 cases the pain was in the front part.

In 7 cases it was mentioned that pain extended from the head, more or less down the spine. Of 17 other cases, this occurred in every one where the sufferer could speak. The record does not show that this extension did not take place in other instances.

Delirium

was not mentioned in	cases	12
" perhaps masked by coma in	"	3
The patients were unconscious in	"	4
" " " too young to manifest it in	"	4
		23

This leaves 264 to be accounted for.

The symptom was present in	cases	165
" " " present in "nearly all" of	"	24
" " " generally present in	"	16

The symptom was present in "nearly all not relieved in 24 hours" in	"	14	
Present "in all the fully developed cases" in a group of	"	18	
		237	
Delirium was *absent* in	"	26	
" " not marked in	"	1	—264
			287

Thus, in a very large majority of the 264 cases to be reckoned upon, delirium was present. The *character* of the delirium was variously described as—mild; violent; low muttering, &c.

Of 165 cases in which it was stated, without qualification, that delirium was present, the question as to *logical answers* was not mentioned in cases 23

Logical answers were given in	cases	104	
" " " "*generally*" given in	"	17	
" " " *not* given in	"	21	—142
			165

It results, therefore, that in a very large majority of the cases, 165 in number, in all of which it was stated that delirium was present, and in which our reporters replied to the question as to logical answers, the delirious could be roused to give such answers.

Also, of the cases which will be found numbering 72 on pages 94 and 95, in which delirium was said to be more or less *generally* present, the delirious could, in a majority, be roused to give logical answers.

Opisthotonos

was not mentioned in	cases	23
Replaced by emprosthotonos in	"	1
Doubtful in	"	2
		26

leaving 261 cases to be accounted for.		
There was *severe* opisthotonos in	cases 107	
" " slight " in	" 80	
	187	
There was opisthotonos "in nearly all" of a group of cases amounting to	9	
There was opisthotonos "in about two-thirds" of a group of cases numbering	17	
	213	
Absent in cases	48	—261
		287

TENDERNESS AT NUCHA

was not mentioned, not observed, or not recorded, in	cases 75	
was not ascertainable in	" 1	
The patients were unconscious in	" 3	
		79
leaving 208 cases to be accounted for.		
The symptom was present in	cases 121	
do. "in nearly all" of	" 15	
"Probably in all" of	19	
	155	
There was great soreness and stiffness in	" 1	
In all who could describe in	" 7	
Replaced by *pain* on motion in	" 2	
" " " between shoulders in	" 1	
" " "pain"	" 2	
Absent	" 33	
"Not marked"	" 7	—208
		287

It may be estimated that *tenderness at nucha* was present in about three-fourths—or at least in more than two-thirds—

of the 208 cases competent to be reckoned upon. Perhaps if attention had been drawn to the symptom we should have had reason to rate it as still more frequent.

Pulmonary or Pleural Symptoms.

Among these we include, those slight and severe, sympathetic or otherwise. (Vide tables.)

They were not mentioned, or not observed, in	cases	71
leaving 216 cases to be accounted for.		
Present in	cases	59
" " "most" of a group of	"	17
Hurried respiration "generally" present in a group of	"	9
Respiration abnormal in about half of a group of	"	19
Above symptoms present "in some" of a group of	"	16
Above symptoms "not mentioned" of a group of	"	7
Above symptoms absent	"	89—216
		287

N. B.—Among the so-called pulmonary symptoms, *difficult respiration*, as simply a functional disturbance, figures largely. (See tables.)

Abnormal Conditions of the Heart, including those of the Pulse.

For descriptions of the above, we refer to the tables. The figures below relate almost entirely to the *pulse*.

Abnormal conditions are set down by us as indefinitely described, not recorded, or not mentioned, in	cases	50
This leaves 237 cases to be accounted for.		
Abnormal conditions were present in	cases	174
" " were generally present in	"	19

The pulse was generally frequent in	cases	7	
" " " variously affected in	"	18	
No "well-marked" abnormal condition of heart or pulse in	"	16	
The pulse was "not particularly quick" in	"	2	
" " " "not much disturbed" in	"	1	
			237
			287

It may be seen, by inspection of the tables, that there was no one departure from the normal standard of the pulse generally characteristic of the cases. It was occasionally retarded; sometimes variable; often accelerated. In some instances, again, it was not much affected.

Abdominal Symptoms.

As it does not clearly appear in most of the circulars whether abdominal symptoms, when not recorded, were absent or mention of them omitted (owing to a misprint in the circulars), we give no summary of results; but refer to the tables for descriptions of such as are alluded to. *Nausea* and *vomiting* are not unfrequently spoken of.

Abdominal symptoms have generally no prominent place, either in the accounts which have come down to us of the epidemic of 1806 to '15, or in the published reports of later visitations of the disease.

Petechiæ or other Morbid Appearances of the Skin.

The descriptions we have received of the above are given n a condensed form in the tables.

Morbid appearances of the skin were not mentioned in	cases	29
Were not looked for in	"	7
Were not recorded in (hospital cases)	"	2
		38

leaving 249 cases to be accounted for.

They were present in	cases	129	
They were very general in	"	19	
Peculiar condition of the skin, in some cases without spots, of a group* of	"	11	
They were "not marked" in	"	6	
They were not present in	"	84	
			249
			287

We may say, then, that petechiæ, or analogous spots, were present to a marked degree, in somewhat less than 59 per centum — of 249 cases competent to be reckoned upon. It is easy to see, on inspection of the tables, that *petechiæ* and *opisthotonos* were often combined in the same individual.

THE TERMINATION

was not stated in			cases 9
leaving 278 cases to be accounted for.			
The termination was *fatal* in	cases	170	
Recovery took place in	"	108	
			278
			287

The percentage of *fatal* cases in the 278 cases to be reckoned upon was a little over 61. The percentage of *recoveries* was a little less than 39.

AUTOPSIES, TREATMENT, REMARKS.

Where there has not been room for either of the above in the tables, we give them here, designating the cases to which they belong by numbers corresponding with those under one or more of the above captions in the tables.

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* Vide tables. Cases of Dr. Orcutt, Worcester Co.

I. Dr. E. G. Wheeler, Becket. No *autopsies.*

Treatment. In two cases Dr. W. took blood freely from the arm in the commencement, and in all cases followed up the antiphlogistic plan, whenever arterial action seemed to call for, or even allow of it; aided by counter-irritants along the course of the spine. For internal remedies he depended chiefly upon sulph. quinine and opium, and generally gave them in combination.

Remarks. In one patient, æt. 45 years, Irish, a respectable laborer, the symptoms yielded very readily to prompt antiphlogistic treatment — venesection, cupping and counter-irritants over the spinal cord, and internally quinine and opium. Subsequently, on the second day from the attack, he was able to sit up, and when left alone went down stairs, and some four or six rods to the spring through thawing snow, having only thin shoes on. Immediately upon his return to his chamber, he was taken with a severe chill; skin became cold and blue, no reaction came on, and he died in a few hours. * * *

II. Dr. William W. Greene, Pittsfield.

Autopsies in three cases. Brain much engorged. Base and spinal cord covered with a yellowish green, illy organized exudation, which sometimes lined the ventricles, and covered posterior part of cerebellum.

Treatment. Cathartics, anodynes to relieve pain, large doses of quinine and stimulants, decided counter-irritation at nucha. In one, venesection.

Remarks. The exudation resembled very much that of diphtheria. One man was violently attacked with cerebro-spinal symptoms and abundant spots, lasting for two days, when an abundant exudation occurred in the throat, and all the pain, delirium, opisthotonos, tenderness, &c. disappeared.

III. Dr. David Rice, Leverett, &c.

Treatment. Blisters the sheet anchor, applied successively to the spine nearly its whole length; mild cathartics;

during convalescence, stimulants and tonics; frictions with tincture of cayenne and alcohol; mild anodynes; cupping.

IV. Dr. D. Bradford, Montague.

Treatment. Anodynes, stimulants, and aperients. Sudorifics at first, with bottles of hot water externally and sinapisms. Opium and stimulants were given freely on last days of sickness.

V. Dr. C. Temple, Heath, &c.

Treatment. Opium in the early stages; later, quinine, or protoxide of iron with Peruvian bark.

Remarks. The patient, aged 11 years, who was sick sixty days, did not speak or move a limb, except the left foot, at any time from the 6th to the 36th day, then gradually recovered.

VI. Dr. James Holland, Westfield.

Autopsies. Morbid appearances were confined to the membranes at the base of the brain and in spinal column. Color of dura mater was darker. Patches of coagulable lymph of greenish color were found scattered between the arachnoid and pia mater at base of brain. Spinal cord invested completely by thin lymph. Turbid serum was found in every case, and, in some, pus and small clots of blood. Caries of two of the lumbar vertebræ, at the point of exit of the spinal nerves, was found in one case. Paralysis of the lower limbs attended this case for five weeks previous to death. *Induration* of the spinal cord was found in every case. *Softening* of the medullary substance of the brain or cord was *not discovered* in any case, save the one in which caries of the lumbar vertebræ existed, and that only at the point where the bone was diseased. At this point pus was found, a portion of which had passed out along with the spinal nerves into the adjacent muscles.

Treatment. No mode of treatment adopted was satisfactory. The application of large numbers of leeches to the

occiput and neck, keeping up the bleeding for a length of time by means of warm fomentations, gave relief for one or more days in every case where made. Cupping did not answer as well as leeching. *Strong* mustard poultices, frequently renewed, to the whole length of spine, gave great relief to pain. Blistering largely with emp. lyttæ also afforded the same temporary relief. Calomel purges in the very first stage, were in every case administered, and small doses repeated several times daily until the gums were touched, without permanent benefit. Opium in various forms, hyoscyamus and belladonna were given with good effect in allaying pain—but never in large doses. Fluid ext. veratrum viride, in doses from three to five drops, afforded marked relief, abating the throbbing pain in every case in which it was given. It was given every two or three hours during the paroxysms of pain, which usually returned in the night time. As an arterial sedative, it far excelled every other remedy I used in treatment of this disease.

Remarks. Rigid contraction of the muscles of the spine was a marked feature in every case in 1858—especially was this noticed in the muscles of the neck in every case. Two children, one eleven and the other thirty months old, were unable to swallow anything for a period of about eight days previous to their death, so violently and rigidly were their heads drawn back. They died on the eleventh day of the disease.

VII. Dr. W. M. Trow, Williamsburg.

Remarks. There was soreness of the throat, slight. There was nothing to indicate immediate death till a few moments before the patient expired.

VIII. Dr. A. W. Thompson, Northampton.

Treatment. Supporting and stimulating, with various devices from day to day, according to the indications.

Remarks. In one case the tenderness at nucha, which was marked, was followed by utter loss of power of the muscles which move the neck.

IX. Dr. L. E. Marsh, Granby, &c.

Treatment. Antiphlogistic and sedative at the commencement—afterwards stimulant and tonic.

Remarks. In several cases congestion of the lungs complicated the disease. In three of the cases paralysis supervened, and those proved fatal. In one case *pleuero-pneumonia* set in and carried off the patient, a woman of 45.

Dr. M. considers the disease of the same nature as diphtheria. *In one case—a girl of* 15—*there was complication with diphtheria.* The patient recovered and was well the August following her attack (which was in March), excepting in point of strength.

X. Dr. J. W. Gooddell, Greenwich.

Treatment. Tonics, stimulants, and nourishment "of the *strongest* kind;" also powerful counter-irritants the whole length of the spine, particularly at nucha. Blisters, iodine, chloroform, ammonia, cupping, &c. &c. To one boy, 13 years old, Dr. G. gave almost a *pint* of whiskey in two hours, with no perceptible effect.

Remarks. The "locality" was a sandy plain, with a pond one mile distant, both east and west. Beyond are the hills of Hardwick on the east, and those of Prescott on the west.

In the month following these cases, says Dr. Gooddell, "*we had some* 30 *cases of severe typhoid pneumonia — many commencing with all the symptoms of meningitis.*" Some of these cases were left in a very prostrate condition; one was followed by paralysis of right arm. All of them recovered except two, who were over seventy-five years of age.

XI. Dr. George G. Tucker, Westfield.

Autopsies. Dr. T. made 8 autopsies. He found the cerebral substance not morbidly affected. Patches of lymph

were almost always seen distributed over the surface of the pia mater with some opacity of the membrane; and also collections of fluid lymph of variable quantity, extending sometimes the whole length of the spinal cord and completely surrounding it. The cord itself was very perceptibly changed in many cases—softening in different degrees—some sections being of about the consistence of cream. Membranes somewhat injected.

The *treatment* consisted in powerful counter-irritants applied over the spine—sinapisms, blisters, setons and the actual cautery; an efficient cathartic at the commencement, with alteratives in the form of mercurial preparations, and permanganate of potash. Opium was always used freely when the brain tolerated it. Inhalations of sulphuric ether were frequently given, with much temporary relief. In the more prolonged cases, assuming an adynamic condition—iron, quinine, strychnine, electricity, alcoholic stimulants. Some cases put on a "typhous" aspect at the commencement, which required general treatment of a tonic and stimulating character.

*Remarks. The mode of invasion varied considerably in different cases. In some there were the usual symptoms of febrile disturbance; chills, rigors, pain in limbs, head, &c., with occasional vomiting, diarrhœa, or costiveness; the neck gradually becoming stiff, followed by opisthotonos more or less complete. * * * In other cases there were no formative periods or premonitory symptoms, the patient being suddenly insensible and convulsed, with the rapid formation of opisthotonos, which in five or six cases was very perfect.* * * * The character of the delirium varied in some respects. In the cases attacked suddenly it was impossible to arouse them, or arrest attention in the slightest degree. In cases not suddenly attacked, the patient would at times fix the mind upon questions asked, long enough to give intelligent answers. Some degree of bronchial irritation and pulmonary congestion were present in some cases, though never sufficient to be a complication of much importance. * * *

XII. Dr. J. Abbott, Westfield.

Says the remedies which seemed to do the most good were Bryonin and Rhus toxicodendron—the strong tinctures.

XIII. Dr. William G. Breck, Springfield, &c.

Autopsies showed, in cases in which death occurred early, inflammation of membranes of brain and spine; in those which died later there were purulent deposits. There were, however, traces of pus in some rapid cases.

The *treatment* was by counter-irritants of the most active character. Sedatives, alteratives, and in some cases opiates, acted well. In some cases, also, large doses of hydrargyri submurias seemed to have good effect. Oil of turpentine and veratrum viride were given.

Remarks. The cases that did the best were those in which the occiput and the whole spine were early vesicated—calomel in large doses being given *early.*

XIV. Dr. M. Calkins, Springfield.

Treatment. Tr. aconite, cold water to the back of the head and the spine, hot pediluvia, copious draughts of tepid water.

XV. Dr. William Holbrook, Palmer, &c.

Treatment. A variety of treatment was tried: stimulants, tonics, cupping, blistering, &c. &c.; opium, calomel, veratrum viride, &c. &c.

XVI. Dr. Samuel Shaw.

Treatment. Aconite and belladonna—applications of cold water to the affected part. In the first case he saw, Dr. S. applied mustard paste, but found it to aggravate the difficulty. He then adopted cold water as an application, with better results.

XVII. Dr. J. P. Lynde, Athol.

Autopsy. Dr. L. examined the spinal cord in one case, and found it coated over with a thick, greyish white *albuminous,*

or, some would say, *fibrinous* exudation, slightly adherent to the membranes. Brain not allowed to be examined.

XVIII. Dr. F. A. Wood, Petersham.

Treatment. In 3 cases which died, Dr. W. gave whiskey, anodynes, and tonics. In one which recovered, he purged with calomel, blistered the base of the skull, and cupped the temples till faintness took place.

XIX. Dr. A. A. Orcutt, Hardwick, &c.

Treatment. Hot baths, and cloths wet with very hot water to the nucha; tonics and stimulants.

XX. Dr. S. P. Martin, New Braintree, &c.

Treatment. Warm baths, hot applications to spine, counter-irritants, cupping, occasional cathartics, anodynes, tonics, stimulants.

XXI. Dr. E. M. Wheeler, Spencer.

Treatment. The first case got a brisk emetic and a cathartic. The other had spontaneous vomiting and diarrhœa. They both received anodynes, morphine and chloroform, hot stupes of dilute alcohol, occasional laxatives — followed by tonics.

Remarks. In the last case mustard was attempted to be applied to the spine previously to Dr. W.'s arrival, but was followed by appearances of approaching convulsions, and was removed. Both patients had numbness of the arms and legs; and one had ostitis of one knee, which lasted some months.

XXII. Dr. J. T. Rood, Brookfield.

Treatment. About twenty minutes after the patient first complained of being ill, she had a convulsion. Soon after this Dr. R. saw her and found no perceptible pulse. He gave whiskey *very freely,* and as soon as the pulse rallied, immersed her in a warm bath; then stimulated freely again, and put a strong sinapism about six inches wide the whole length

of the spine—applied heat to the feet and cold to the head. In ten hours from first attack the patient went to sleep, and from that time her convalescence was rapid. This is the case alluded to before as one of sudden invasion, treated after the manner of sunstroke in India.

XXIII. Dr. G. D. Colony, Fitchburg, &c.

Autopsy. There was *no* post-mortem in either of Dr. C.'s cases. But he mentions that at the autopsy of a patient of a neighboring physician in Westminster, the surface of the brain and the spinal cord, "beneath the arachnoid and investment," was covered with a yellowish half-organized deposit, quite abundant in many places.

XXIV.. Dr. Benjamin F. Heywood, Worcester.

Treatment. Dry cups to back and sides of neck, sinapisms, opiates, diffusible stimulants.

XXV. Dr. O. Martin, Worcester, &c.

Treatment. Free purgation to begin with. Blisters to neck and spine. Opiates to procure sleep. After a few days, stimulants and nutriments. The bowels were kept open without purging.

Remarks. Dr. M. says one of the cases was left very feeble, also deaf. He was subsequently drowned in less than four feet of water—falling, as was supposed, in a convulsion generated from the old disease.

XXVI. Dr. C. C. Field, Leominster.

Treatment. Alteratives and laxatives, blisters, low diet.

XXVII. Dr. C. A. Wilcox, Upton.

Treatment. Calomel, opium and camphor, cathartics, frictions, with stimulating agents along the spine.

XXVIII. Dr. C. W. Barnes, Marlboro'.

Remarks. In the case showing no convulsions, there was constant jactitation. No. 1 was attacked soon after recovery

from scarlet fever; No. 2, immediately after coasting on a very cold night.

XXIX. Dr. F. Bundy, Billerica.

Treatment. The first case did not recover "from the congestive stage." Stimulants and mustard were used freely. In the second case, morphia to control pain, cold to the head; also showering, beef tea, veratrum viride, cathartics and injections.

XXX. Dr. C. Jordan, South Reading.

Treatment. In two, depletion with counter-irritation to the spinal column and extremities. Both fatal. Third case, counter-irritation and tr. ferri murias. Recovered.

XXXI. Dr. J. Allen, Boxford, &c.

Treatment. Permanganate of potassa was given to the child that recovered. Was attended with a copious secretion of urine.

XXXII. Dr. S. Salisbury, Brookline.

Treatment. In the older patients cathartics at first, then antispasmodics; in the younger, expectant treatment.

Remarks. In the recoveries, convalescence was very slow. All the patients slept in apartments small, in proportion to the number of occupants, and made as close as possible.

XXXIII. Dr. J. S. Greene, Dorchester.

Treatment. A cathartic at the outset, enemata subsequently; opiates; aconite or veratrum viride *pro re nata;* permanganate of potash; quinine in early convalescence, turpentine later; whiskey was not well borne. Beef juice was given freely during the acute stage. Cold to the head was used, and counter-irritation assiduously.

XXXIV. Dr. C. E. Ware, Boston.

Treatment. Supporting, with moderate doses of quinine, was the course with all the successful cases. Dr. W. lost

none after he followed it persistently. He thought a very free use of stimulants, especially early, decidedly mischievous.

Remarks. In several of these cases diphtheria unequivocally existed. In one family where there were four cases, unquestionably all of the same disease, the petechial eruption and the diphtheritic condition of the throat existed in some, but not in all.

XXXV. Dr. L. R. Sheldon, Boston.

Treatment. Ice to the head and back of the neck; veratrum viride; frequent sponging of the surface. Dr. S. has used a mixture of belladonna, nitric and chloric ether *freely*, and opiates occasionally.

XXXVI. Anonymous, Boston.

Remarks. The case occurred on the last of three consecutive days of the most intensely cold weather of the season. [Contrast this fact with the warm damp weather which marked the commencement of the disease at Westfield, in 1857. See page 79.]

There were chills at first, followed by general pains and vomiting. The child ate her breakfast as usual, and went to school apparently in good health. She was seized while in school, and died in less than forty-eight hours.

XXXVII. Dr. A. A. Gould, Boston.

Treatment. The jaws were so rigid that no internal remedies were effectually used after first day. Cold to head and back of neck—heat to the feet—frictions and stimulants to surface.

Remarks. The patient was five months pregnant—aborted on second day—no relief to rigidity, and no return of consciousness afterwards—except there was always moaning expressive of pain on any attempt to turn the head or move the body.

XXXVIII. Dr. J. F. Gould, South Boston.

Treatment. Ice to the spine—laxatives—broth. Owing to an abscess of the throat, one patient could not swallow food or nourishment, except for about twenty hours of the first part of the disease. This case was fatal.

XXXIX. Hospital case under care of Dr. J. B. S. Jackson.

Treatment. Leeches to the renal region. Pulv. Dov.—Hoffman's Anodyne—the first three days took ℞ Pulv. opii gr. ¼; Antim. tart. gr. ⅛; Hyd. submur. gr. j.; ter die.—After that, symptoms were treated as they came on.

Remarks. "This case has been marked as cerebro-spinal meningitis, as it is believed to have been a case of the disease described under that name; not that I think there was any proper inflammation of the membranes." Signed,

"Jackson."

XL. Hospital case under the care of Dr. A. A. Gould.

Autopsy. Head. The pia mater at the base of the cerebellum, around the medulla oblongata, in two very limited portions near the vertex, and in one posterior lobe, was infiltrated with thick pus. The ventricle contained about ℥iij. of turbid serum. The substance of the brain appeared normal. *Spinal Cord.* The spinal cord was so much swollen in the cervical portion as to fill the canal. The pia mater throughout was opaque, and more or less infiltrated with pus. While contained within the membranes, the cord felt very firm, and was much stiffened, but on incision it proved to be decidedly softened.

XLI. Cases at City Hospital in Boston, reported by Dr. J. N. Borland.

Treatment. In the cases that recovered ergot was used, being suggested by Dr. Upham. Ice to the head and sinapisms to the feet were also employed. A chloroform epithem to the epigastrium in one case quelled pain, and convulsions, and procured some sound sleep. The patients, three in num-

ber, which came under Dr. Borland's care, were stimulated and nourished as highly as possible.

Remarks. By a singular coincidence, the five cases at the City Hospital all occurred on the same side of the same ward, at about the same time. The windows on this side of the building look towards a piece of wet miry ground, but were closed when these cases occurred, as it was in the winter season. All the wards of the hospital are supplied with fresh air pumped through the heating apparatus from one and the same source—an aperture of entrance directed towards the hills of Roxbury, and away from the miry ground just mentioned. The cases occurred in patients convalescent from other diseases, except one who had pneumonia at the time the cerebro-spinal meningitis set in. "Their severity," says Dr. Borland, "in the three last at any rate, was proportionate to the constitutional strength of the patients. They all had intense spinal pain and tenderness, headache, and præcordial pain. Their positions in bed were very similar. There was likewise a similarity in the almost unconquerable constipation during the severity of the sickness; and the marked relapses of each of the three after convalescence were apparently well established. They were daily seen by Dr. Upham, who recognized them as the same disease he had seen so much of in the Stanly Hospital.

XLII. Cases at Gallop's Island, reported by Dr. Calvin G. Page, Post Surgeon.

Remarks. In the case where opisthotonos was replaced by *emprosthotonos*, the body was bent not only forward but to one side, so that the patient was made frequently to roll over to that side and out of bed.

In several among the fatal cases, the symptoms were imperfectly developed. But "by exclusion" they were classed with the others. Dr. Page says, that other cases also, but of a mild character, occurred, though they hardly deserve mention. He adds that erysipelatous eruptions occurred on the third or fourth day of attack (in those of course who

lived long enough); and further, that in all cases where the patient was conscious, soreness of the limbs and feet prevailed. In most cases there were involuntary discharges from the rectum and bladder.

XLIII. Cases at Fort Warren—reported by Dr. Joel Seaverns, A. A. Surgeon U. S. Army.

Remarks. Dr. Seaverns says two features have particularly struck him, as worthy of mention in the history of his cases—the one, an excessive cutaneous sensibility at the outset of the disease, to such a degree that the patient, even when almost in a state of syncope, shrieks and cries out at the most trifling pressure: the other is the tendency to *relapse* which seems to be, says Dr. S., in a degree periodical, so that the patient, if he survive the first invasion, becomes apparently convalescent by the third or fourth day, to be again much worse after a week, when another improvement occurs, and a second relapse; and so on, till the patient's strength becomes exhausted.

The case reported as of thirty-seven days duration survived several of these renewed attacks, and at length died from the exhaustion consequent thereon, and a parotid abscess; having been repeatedly convalescent as it seemed. Each of these relapses commenced with severe pain in the back of the head and neck, followed by delirium, and increase of fever.

RESULTS OF AUTOPSIES IN MASSACHUSETTS.

Autopsies in Massachusetts, as elsewhere, have been few in this disease. All that we have collected, however, from this State, in well marked instances of the disease, tell the same story of *meningeal inflammation.* A summary of them would be but a repetition of what is contained in the descriptions quoted in the earlier part of this report.

RESULTS OF TREATMENT IN THE TABULATED CASES.

Setting aside the treatment by ergot (in three cases at the City Hospital in Boston) and some matters of detail, we may say that the following have been the modes of treatment resorted to in our collection of cases, viz. : antiphlogistic ; stimulant and supporting ; that of liberal drug medication ; perturbating ; expectant. But, we are unable to *generalize* in favor of any of these. That which has been followed by a happy termination in one group of patients, has, in another set, been less fortunate.

THE INVASION OF THE DISEASE.

Although, as we have before remarked, we desired to make the list of queries in the circulars as short as the purpose of our inquiry would admit, we regret that we did not put the question whether the invasion of the disease was *sudden* or otherwise.

We however take the liberty of supplementing the deficiency on that point by borrowing the following statements of the results of investigation of the subject, by M. Tourdes, in France. One paragraph we translate from the "Compendium de Médecine Pratique," by Monneret and Fleury, as follows :

"It has been generally said that the approach of epidemic meningitis is not announced by any precursory symptom. M. Tourdes declares, on the contrary, that it is far from true that the patient is invariably struck down at once (que l'invasion foudroyante est loin d'être constante) ; that such an event is the exception, and not the rule ; and that it took place in only a quarter or a third of the cases at most."

Valleix also quotes from the same observer—M. Tourdes—as to the order of frequency of the precursory symptoms, as follows : "Cephalalgia, 33 times ; chills, 13 times ; nausea and vomiting, 13 ; rachialgia, 3 ; pains in the limbs, 2 ; ver-

tigo, 2; general discomfort (malaise), 2; diarrhœa, 2; delirium, 1; trembling, 1; febrile movement, 1."

Dr. George G. Tucker, of Westfield, it will be recollected, in his remarks on the sixteen cases furnished by him for our tables, gives a good description of the different modes of invasion.

RELIABILITY OF THE CASES.

In stating the number of towns variously heard from, we mentioned three as doubtfully reported. The cases from those towns are not the only doubtful ones we have received, as others have come in from places otherwise affirmatively reported.

We have entered two or three cases on the *ipse dixit* of the reporters, where we had no reasonable doubt of the accuracy of the diagnosis. But we have taken the liberty of rejecting in some instances, and we think the cases in the tables are reliable. It must be remembered that spotted fever, or cerebro-spinal meningitis, presents different groups of its symptoms in different subjects; and therefore, though the symptoms set down in the tables may have been only partially, or scarcely at all present in particular instances, yet, on reading the accounts of the cases furnished us by their observers, it may be obvious that they belong to the disease in question. On one occasion, where certain cases looked bare in the tables, we wrote to their reporter asking the grounds of his diagnosis, and received in reply a graphic description which left no doubt that the cases were properly included in our list. Again, the symptoms, such as they are, are sometimes imperfectly developed, and yet by the process of exclusion the cases may be rightly classified with others of the disease under consideration, as evidently belong *nowhere else.* For example: Dr. Page says of his experience at Gallop's Island, "in several among the fatal cases, the symptoms were imperfectly developed, but by exclusion they were classed with the others."

We shall take occasion presently to offer an account of certain doubtful or spurious cases. In the mean while we give some additional cases, which arrived too late for insertion in the tables.

ADDITIONAL CASES.

Five cases in Montague, Franklin County, reported by E. A. Deane, M.D.

They were taken sick respectively January 16th, March 29th, April 13th, April 26th, May 4th, 1864. Dr. Deane had no idea of the source of the disease. The cases showed no preference for any particular locality—high or low, damp or dry. They occurred in different parts of the town, which is partly hilly and partly level, settled by a farming population. They were in places rather sparsely settled. They made no distinction between the wealthy or poorer classes. The ages were eighteen, six, ten, twenty-one and forty-two years. The disease seemed to prevail as an epidemic in this and the adjoining towns. Dr. Deane saw other cases in consultation, in the surrounding villages.

The average duration of the cases was about three weeks. The greatest duration was six weeks. The shortest duration was, for the fatal cases, six days; for those that recovered, three weeks. Three of the five cases had convulsions. There was headache in all—very severe in some of the patients. Four out of five were delirious. Some could not give logical answers; others could a part of the time. The two that died had severe opisthotonos. It came on gradually, grew worse and worse till a short time before death. The muscles all relaxed just before the patient ceased breathing. Two of those that recovered had *slight* opisthotonos. Thus, one of the patients was free from the symptom entirely. Dr. Deane thinks nearly all had tenderness at the nucha. One patient only had pulmonary or pleural symptoms. These were very peculiar. The patient at one time would have all the symptoms of severe inflammation and congestion of one

lung. In a few hours these symptoms would disappear, to be replaced by symptoms referable to some other organ—the heart, the liver, the bowels or the other lung. When the thoracic or abdominal organs were involved, the head was relieved. At one time the breathing was very much oppressed, and there was bloody expectoration. In a few hours bloody dysenteric discharges from the bowels set in. Then all these symptoms would disappear, and the head symptoms return. Petechial spots were frequently seen on different parts of the body, varying in appearance ; sometimes of a scarlet redness, at others dark livid or purple. These would appear and disappear at short intervals. For three or four days during the second week, the whole surface was quite yellow, having a very decidedly jaundiced look. This patient recovered.

It does not appear in Dr. Deane's report whether the other patients had petechiæ or not. Two cases terminated fatally ; one on the seventh day, the other on the sixth day. Three recovered, but very slowly

Autopsy in one case. There was inflammation of the meninges, with abundant deposit of coagulable lymph, more abundant at the base of the brain and near the foramen. This extended down the spinal cord as far as examined.

Treatment. Dr. Deane adopted no definite plan of treatment, but managed each case according to the indications as they presented themselves. He used cold applications to the head ; counter-irritation over the spine, with stimulating liniments, mustard, or blisters ; hydriodate of potassa and opiates internally ; also expectorants, alteratives, cathartics, astringents, tonics—as the cases seemed to require.

PROBABLE CASES.

We have now to present two cases reported to the Boston Society for Medical Improvement, in February, 1866, by David W. Cheever, M.D., as *probably* instances of "cerebro-spinal meningitis."

Case XIII. Nov. 23d, 1865. Mr. G., about 40 years old, of rather feeble physique, a stone polisher by trade, after great exposure, was attacked with pain in back, nausea, chill, and general febrile symptoms, on Saturday evening. These symptoms continuing, I was called to him on Thursday, Nov. 23d. He then had a feverish look, strong typhoidal odor, coated tongue, back ache, and constant retching of bilious matter; pulse not remarkable. This bilious vomiting continued two days, when on Saturday it changed to vomiting of blood. This was constant in large quantities, fluid and not much altered by digestion, for two days. It was uncontrolled by the remedies used. The spleen could be felt much enlarged. Bowels otherwise not remarkable. Mind clear, tongue brown and dry.

An eruption of violet-colored petechiæ resembling typhus appeared on back on Saturday, and became very numerous over abdomen. He died on Monday, five days after I saw him, eight days after first symptoms. No *autopsy*. Surroundings of patient very bad. I regarded the case as malignant typhus.

Case XIV. *Cerebro-Spinal Meningitis, latent until twelve hours before Death.*—Miss ——, 50 years of age, fair health, complained Monday, Feb. 19th, 1866, of pain in foot, back and bowels, followed next day by nausea and vomiting; return of a pale discharge from vagina—menstruation having ceased one year previous. This discharge lasted three days. *Wednesday evening*, Feb. 21, 1866, ten o'clock, I saw her first. She had just gone to bed, having been up all day. Aspect a little flushed; pulse 100; nervous, irritable; complaining of bilious retching. No dejections for some days. Flatulence and pain in small of back. Ordered calomel and bicarb. sodæ.

Thursday. Two sufficient dejections; less retching and flatulence; aspect about same; very nervous; restless; apparently exaggerates her troubles; much rheumatism in family; complains of being unable to move freely on account

of her back, which is without feeling, she says, in lower part; somewhat painful; not tender; no paralysis of limbs or face; eyes natural; no photophobia; hearing normal; tongue moist, thin white coat; pulse 100. Ordered 10 grs. Dov. powder, liniment to back and hot drinks for diaphoresis.

Friday, A.M.—Vomited Dov. powder, and continued to retch a good while—otherwise seems better; skin moist, tongue thin white coat, pulse 80; a little desire for food. Says her back is better, and moves herself more freely. Ordered beef-tea.

11 P.M.—Called to her again. A very little delirious—coherent on being roused—complains that pain in back has shifted to nape of neck; restless, having had no good sleep for several nights. Tongue same—pulse 100; skin soft and moist. Ordered morphia, gr. $\frac{1}{5}$, and repeat if necessary.

Saturday, 9 A.M.—A bad night; restless, delirious; pain in nape of neck severe; jactitation; entire incoherency; vague apprehensions; seeking to avoid her attendants; creeping out of bed; moves limbs freely; no opisthotonos. Pupils obey light; tongue brown and dry; pulse 130, weak, and uneven; subsultus tendinum. Urine passed voluntarily; abdomen not swollen. Aspect of grave disease. Prognosis doubtful. Diagnosis—cerebro-spinal meningitis or malignant typhoid.

11 A.M.—Seen in consultation by a gentleman of large experience. To test the diagnosis from the history of the case, this was detailed to the consulting physician by a relation who had attended the patient throughout, and the case was closed with the events and treatment up to last evening. The impression made on this gentleman was of a nervous case, probably in great measure hysterical. On entering the chamber he concurred with me in thinking she had but a few hours to live, and that the case was one of cerebro-spinal effusion. The patient was wholly insensible, lying on her right side, breathing heavily, but without stertor; covered with perspiration; tongue brown and dry; mouth open; pulse 160, very feeble and thready. Right pupil widely

dilated, and insensible to light; cornea looking as if breathed upon; left pupil natural, and responding sluggishly to light. Nothing abnormal in lungs or heart; bowels soft and not tympanitic; face a little drawn to right side; limbs not paralyzed; no opisthotonos; no petechiæ. In this condition she remained until she expired in a convulsion at 3 P.M. No autopsy could be obtained. The surroundings of the patient were of the best description. No other cases have been reported in that section of the city; and she herself was in average health, the week previous, and up and about her chamber sixty hours before her death. Can any other solution, says Dr. Cheever, of the problem, be offered so probable as cerebro-spinal meningitis?

Case XV. *Blindness as a sequela of probable Cerebro-spinal Meningitis.* Case furnished by Dr. H. W. Williams, of Boston.

A young man of sixteen years, well developed and of very strong constitution, was seen on the 11th of March, 1866. The account given of his previous symptoms was, that he had been suddenly attacked about five weeks previously, with severe cerebral symptoms, accompanied by an appearance of spots all over the skin. He continued unconscious about a week, when he began to improve, and from that time gained rapidly. No further history of the case was obtained except that his eyes remained staring open during much of the period of delirium, and they were from that time greatly injected. His medical attendant had not, however, supposed the symptoms in his eyes to be serious, until alarmed by the appearance of matter in the anterior chamber of the right eye.

On examination it was evident that a deep-seated exudation, of a yellowish color, existed in both eyes. In the left eye the iris had lost its healthy aspect, and the edge of the pupil was extensively fastened by adhesions to the capsule of the lens; but, as in the other eye, the crystalline remained transparent. In the right eye the iris had a more healthy

look, though some adhesions existed. It seemed as if the matter in the anterior chamber had its origin in the collection near the fundus of the eye, and had found its way through the pupil. Scarcely a perception of light remained.

Case XVI. Reported to the Boston Society for Medical Improvement, May 9, 1864, by Dr. C. Ellis. *Symptoms of Cerebro-spinal Meningitis; doubtful appearances of Disease of the Pia Mater of the Brain and Spinal Cord.*

A child, seven years of age, was attacked eleven weeks before death with fever and pain in the frontal region. Ten days after the commencement of the disease, the head was drawn strongly backwards, and opisthotonos became so marked that the shoulders did not touch the bed. This continued until three weeks before death. The pupils were dilated from the commencement until the last day, when they became contracted. Though delirious, the child could always be roused. The pulse at the outset was extremely rapid, hard, full and strong, and so continued for more than six weeks, when it became nearly natural. No nausea nor other symptoms referable to the digestive organs. No chills. No petechiæ until towards the close, and then only to a slight extent. The above were the principal symptoms, obtained from Dr. Holmes, of Milton, who had charge of the patient. There were no special changes towards the close, and death seemed to result from exhaustion.

On examination of the head, the arachnoid was found dry, and the convolutions somewhat flattened. The lateral ventricles contained from four to six ounces of clear serum. The membranes of the base had a slightly opaque appearance, and were somewhat infiltrated, but there were no miliary granulations nor other evidences of disease. The arachnoid and pia mater of the spinal cord were perhaps opaque, and somewhat peculiar, but neither the changes here nor in the membranes of the brain would have attracted special attention, had it not been for the epidemic of cerebro-spinal menin-

gitis prevailing at the time. The thoracic and abdominal viscera were not examined.

The case was regarded as interesting, says Dr. Ellis, inasmuch as morbid appearances not unfrequently met with were accompanied by symptoms which pointed to a lesion of the membranes of the brain and spinal cord, and yet the latter could not be clearly shown to exist. May it not indicate, he asks, that the symptoms of ordinary disease can be modified by the prevailing epidemic influence, although peculiar lesions are not satisfactorily made out?

DOUBTFUL OR SPURIOUS CASES.

It having been alleged that the disease under consideration has prevailed at Amherst College among the students, we present the following note we have received in relation to the matter.

"Amherst College, *August* 8, 1865.

"Dr. Parks,—*Dear Sir:* I answer your printed inquiries not so much because I can give you any light that you ask for, but merely because we have had a disease in our College, which our older physicians, for want of a better name, have termed meningitis.

"For the past two years here, in College—and especially during spring and summer—several of our students have been affected with something like the following symptoms. An intense pain all over the head, and in some part of the spinal cord—generally the upper. This is accompanied by great prostration, and in the worst cases study has been out of the question. All the other functions are maintained with regularity, and never has there been anything like delirium or convulsions attending the disease.

"Belladona has generally had a good effect, and large doses of whiskey also. And in the worst case we had, whiskey would always reduce the pulse as long as the effect of it lasted. * * * * Yours, truly,

(Signed) "E. Hitchcock."

We shall not assume to pronounce upon the cases at Amherst College; but they remind us that more than one observer of spotted fever, or cerebro-spinal meningitis, has reported having seen, during the prevalence of the disease in his neighborhood, mild cases, or cases "not worth mentioning," that were, as we infer, instances of the existing epidemic, or colored by the prevailing epidemic influence.

PATHOLOGY.

We come now to the question what, in the light of present experience, is the "spotted fever," otherwise termed "cerebro-spinal meningitis"? As in the case of the epidemic of 1806 to 1815, we must reply that it is easier to say what it is *not*, than what it *is*.

Discarded opinions. Various fallacies as to the pathology of the disease—for example, its location among the exanthemata—having soon died out, the idea of its having been a form of intermittent or remittent was started, but seems now to have been laid aside, and for reasons already given.

The Typhus Theory. There are some who still regard the disease as a form of British Typhus. In France, M. Boudin declares that cerebro-spinal meningitis is nothing but a species of typhus fever, and assigns to the affection the name of *cerebro-spinal typhus*—a term somewhat similar to that used by some among the Germans—*cerebral typhus*. Valleix remarks that the memoir of Boudin would strongly incline us to admit that many epidemics denominated *typhus* were epidemics of *cerebro-spinal meningitis*, but that such admission is a different thing from the adoption of the writer's conclusions. As to the facts, he says, presented in former writings and supposed to have a bearing upon this question, they are neither sufficiently detailed, nor precisely enough stated to be of real utility in the investigation of it.

In this country, Dr. Baltzell, in the October number of the American Journal of Medical Sciences for 1865, enters into an elaborate comparison of the spotted fever with typhus, to

show the resemblances between them. In relation to the spots, Dr. Baltzell finds that of 27 cases of spotted fever there were *petechiæ* in a little over 61 per cent. He then shows that in Rayer's 194 cases of typhus, the percentage of petechiæ was 80; in Gerhard's 36 cases it was 88; in Stoker's 540 cases, a little over 71; the average percentage of the three observers being, as we make it, nearly 80. Dr. Baltzell claims that the difference ($18\frac{1}{2}$) in the percentage of petechiæ between spotted fever and typhus, is not sufficiently great to separate the two diseases; especially, he says, since ecchymosis, vibices, efflorescences, &c., have been seen in cases of typhus, as well as in spotted fever. In our Massachusetts statistics of spotted fever, we will remark, by way of parenthesis, the proportion of petechiæ or analogous spots was somewhat less than 59 per cent. of 250 cases competent to be reckoned upon.

On the other hand, however, in a German epidemic of cerebro-spinal meningitis, referred to by the editor of the British Medical Journal, no eruption in the slightest degree analogous to the typhus rash was met with in any instance; while another eruption—herpes labialis—was observed in the greater number of cases.

Dr. Stillé remarks that the spots would seem not to belong essentially and exclusively to any disease, but to indicate a certain condition of the blood, and also perhaps of the solids; since they are liable to occur in other diseases, as yellow fever, scurvy, purpura, &c.

Professor Murchison, Physician to the London Fever Hospital, one of the chief authorities on typhus fever, takes ground in favor of the identity of "spotted fever" and typhus in the following line of argument.

"It is well known," he says, "that among the phenomena of typhus the cerebro-spinal symptoms hold a very prominent place. First, there is headache, with vertigo and injected conjunctivæ; then come restlessness, sleeplessness and delirium, followed by stupor or coma. With these symptoms may be associated paralysis of the sphincter or of the detrusor muscles of the bladder, hyperæsthesia, tremors,

floccitatio, subsultus, or general convulsions, strabismus, tetanic rigidity of the muscles of the limbs, or even opisthotonos. Occasionally typhus commences with violent delirium, and other cerebral symptoms, so that more than once I have known it mistaken for acute mania." * * *

"Among the most common anatomical lesions of typhus, are engorgement of the venous sinuses of the dura mater, increased vascularity of the pia mater, and an accumulation of serous fluid in the ventricles, and in the subarchnoid space of the brain and cord.

"It is not many years since these symptoms and lesions were believed to be the result of inflammatory action in the membranes of the brain and cord, and the treatment of typhus was based upon this belief. But the researches of John Reid and of all subsequent observers have demonstrated that there exists no relation whatever between the degree of vascularity and the amount of sub-arachnoid fluid on the one hand, and the severity of the cerebral symptoms during life on the other, while it is now universally admitted among pathologists that the lesions of typhus are quite independent of inflammatory action. This is the result of my own observations ; and the investigations of John Reid, Peacock, Jenner, Jacquot, Barrallier, and of all modern observers who have had much experience in the *post-mortem* examinations of typhus, lead to the same conclusion." * * *

"But, to the rule above laid down, there are exceptions. In rare cases typhus fever is complicated with unmistakable inflammation of the membranes of the brain. At the time of publication of my work on Fevers, I was under the impression that this complication never occurred, but subsequent experience has convinced me that I was mistaken. In the interval I have met with two unequivocal cases of typhus complicated with true meningitis and the effusion of lymph on the surface of the brain." * * *

The drift of the argument here seems to be, that in respect of the morbid appearances within the cranium, spotted fever and typhus stand upon the same footing.

"It is possible," the Professor continues, "that some of these epidemics [meaning epidemics of alleged cerebro-spinal meningitis] were really examples of primary inflammation of the cerebral and spinal membranes; but when this seemed to be the case, it is to be noted that the persons attacked were comparatively few, that no eruption appeared on the skin, and that there was no evidence of the disease being infectious. I would instance in particular the epidemic described by Dr. Mayne, as attacking children in several of the Irish workhouses in 1846, with regard to which the absence was noted of any proof that it has ever been propagated by contagion." * * *

"If to the above characters [the symptoms and morbid appearances of the present epidemic, including the alleged occasional absence of traces of meningeal lesion] be added, the fact that its contagiousness is a disputed question, and that it has been found to prevail chiefly under circumstances of over-crowding and inadequate ventilation, it cannot be surprising that many American physicians admit the close relation of cerebro-spinal meningitis to typhus, while some maintain the identity of the two diseases. It may be well therefore to consider the four points of distinction between them, laid down by Dr. Lidell, and in doing so I adopt the writer's own words:

"1. 'Spotted fever often runs its course in a few hours. Typhus requires at least several days.' The rapid course of many of the American cases, and of epidemic cerebro-spinal meningitis generally, is no doubt remarkable, but is not sufficient to found a distinction, for many cases of typhus are on record where the disease has terminated fatally on the second or third day, or even after a few hours." * * *

"2. 'Spotted fever is frequently attended with convulsive movements; typhus fever is never so accompanied.' My experience of typhus is precisely the reverse. Convulsive movements are not uncommon." * * *

"3. 'Spotted fever patients often die suddenly and unexpectedly of coma and asphyxia; typhus patients do not

die in this way.' According to my experience of typhus, the most common mode of death from the primary fever is by a combination in various proportions of syncope and coma. A large proportion, also, of fatal typhus cases are complicated with pulmonary disease, and then death occurs by coma and asphyxia. Moreover, I have repeatedly known patients who appeared to be going on well, become suddenly comatose, and die in a few hours."

"4. 'The eruption in spotted fever frequently appears on the first day; while in typhus the eruption does not appear till the end of the week or more.' According to my experience, the eruption of typhus usually appears on the third and fourth day, is rarely delayed beyond the sixth day, and may sometimes be noted on the second day. It is well known that in severe cases of most blood diseases petechiæ may appear as early as the first day. The sooner the eruption of variola appears, the more grave is the case."

Professor Murchison expresses the opinion that "the grounds for drawing a specific distinction between the epidemic cerebro-spinal meningitis or spotted fever of America and typhus fever, are most inconclusive, and particularly when it is recollected that typhus fever, running the ordinary course, has been prevailing in many parts of America since the commencement of the present war. I agree entirely with the opinion expressed by Dr. Upham." The Professor then quotes from Dr. Upham's paper on the disease at Newbern, in which monograph the opinion approved by the former is stated in these words: "The disease seemed to me rather to partake of the nature of typhus in a severe and malignant form, * * * having in this instance a special direction to the meninges of the brain and spinal cord." Dr. Murchison pays a just tribute to the ability of Dr. Upham's memoir.

It is not our province to enter into the discussion of the pathology of the disease, but it is perhaps our duty, as reporters, to note that where Professor Murchison says that the contagiousness of spotted fever is a disputed question, the

medical profession of *this* country should have been excluded from the list of disputants, since its non-contagiousness is very generally taken for granted here. Again, in stating that the disease has been found to prevail chiefly under circumstances of over-crowding and inadequate ventilation, the remark is hardly applicable to the United States, where in civil practice the reverse has been the rule. The learned Professor, we presume to suggest, may have been laboring under some confusion in classing together, as he does in his paper, the American with some other European epidemics, and with the Russian Plague.

Further, Dr. Murchison mentions the cerebro-spinal meningitis of the Irish work-houses in 1846, described by Dr. Mayne, as an example of "some epidemics" which he thinks were possibly real instances "of primary inflammation of the cerebral and spinal membranes." The absence of eruption in, and the non-contagiousness of the Irish cases, tally—the former with what has often—the latter with what has generally—been noticed in this country. And, the cerebro-spinal meningitis of Dr. Mayne has frequently been quoted by American writers as a disease, the counterpart of our "spotted fever." We will venture, also, one more criticism. It seems to us that Dr. Murchison compares what is the exception in typhus with that which is the rule in spotted fever.

We can conceive that on the negative side of the question of the connection of "spotted fever" with typhus, the same line of argument may be used as that of Dr. Holmes in speaking of the epidemic of 1806 to 1815—that a disease which is sometimes almost as sudden in its invasion as a stroke of lightning; which is rarely suspected of being contagious; which gives us a solitary case in a ship of war, a single case in a boarding school, two cases only in an almshouse; which in civil practice affects the villages and isolated farm-houses of the interior (where typhus "running the ordinary course" is unknown) as much at least as the large cities; which in a great majority of cases is fatal in a few days or even hours; the mortality of which is very variable: such

a disease presents so many points of difference, when compared with British typhus, that we should hesitate before pronouncing the two identical.

In fact, the editor of the British Medical Journal, commenting, in the number for July 8th, 1865, on Dr. Sanderson's description of cerebro-spinal meningitis in Germany, contrasts the differences between that and typhus, with the result that "it is impossible to place the two diseases next to each other in the nosology, much less to admit their identity."

The Inflammation Theory. Among those by whom the typhus and other above-mentioned theories are disowned, the question of the pathology is narrowed down to this alternative, viz.: either it is a form of cerebro-spinal meningitis (typhoid, some would say), or else it consists in its essential nature and primarily of some occult change, other than typhus—some alteration of the fluids or solids of the economy—the meningeal lesion being a secondary phenomenon.

The former view is maintained by Dr. Stillé, and others, who hold that meningeal inflammation is declared by the symptoms and *post-mortem* appearances.

As bearing on this side of the question, we translate from the "Compendium de Médecine Pratique" the following analysis of blood taken from patients with cerebro-spinal meningitis.

"The blood was rarely buffy. In cases where there was a buffy coat, it was thin, variegated, imperfect. In the dead subject the blood was remarkable for the abundance and the density of fibrinous clots. The blood was submitted to analysis according to the process suggested by M. Dumas, and followed by MM. Andral and Gavarret."

First Experiment, second Day, third Bleeding.

Fibrine,	4.60
Globules,	134.00
Solid matter from serum,	71.16
Water,	790.24
	1000.00 parts of blood.

Second Experiment, second Day, first Bleeding.

Fibrine,	3.90
Globules,	135.54
Solid matter,	79.64
Water,	780.92

Third Experiment, second Day, first Bleeding.

Fibrine,	3.70
Globules,	143.00
Solid matter from serum,	58.50
Water,	794.80

Fourth Experiment, third Day, second Bleeding.

Fibrine,	5.63
Globules,	137.84
Solid matter,	60.33
Water,	796.20

"It will be seen," the writer continues, "that the quantity of fibrine is between 3.70 and 5.63; that is to say, between a minimum,* which is already a pathological condition, and the figure which is only reached in well-marked phlegmasiæ." * * * "The decided increase in the fibrine is an experimental result of great importance, and one which assigns to epidemic cerebro-spinal meningitis the rank occupied in nosography by the phlegmasiæ of the serous membranes. But the epidemic constitution impresses upon these phlegmasiæ a more rapid march, and a greater gravity

* In Carpenter's Physiology we are told of a healthy specimen of blood giving, by each of four different methods of analysis, 1.56 parts of fibrine in a thousand; another specimen, 1.95 parts, by all the same four methods of examination. Carpenter estimates the *average* amount of fibrine in health on the basis of the analysis of Lehmann (quoted also by Dalton), who makes the proportion of fibrine in the *plasma* alone of the blood, to be 4.05 parts. As the plasma constitutes about half the entire volume of the circulatory fluid, Carpenter sets the proportion of fibrine in the latter at 2.025 parts in a thousand.

than obtains in sporadic inflammation of the meninges. That is the only point in which they appear to us to differ from the latter. [?] In a case of cerebro-spinal meningitis, MM. Andral and Gavarret ascertained an increase in the fibrine of the blood.

"There have been found in the heart and large vessels fibrinous clots, thick, yellowish, quite adherent to the columnæ carneæ. Some authors, it is true, speak of fluidity of the blood; but their observations are wanting in detail."

The opponents of the theory that the inflammation in spotted fever is the primary pathological fact, claim for the support of their position: first, the different behavior of the disease from that of ordinary meningeal inflammations; secondly, the futility in that malady of all the means usually more or less influential in combating such inflammations; thirdly, the occasional occurrence of cases, at the autopsies of which no morbid appearances within the cranium have been detected.

The first point—the different behavior of the disease in its course from ordinary meningitis—will perhaps be explained by the typhoid character of the epidemic. The second point—its resistance of the ordinary remedies of meningeal inflammation (always provided it be proved that it is never benefited by depletion)—may also, perhaps, be disposed of in the same way.

It remains, therefere, to consider the allegation that there have been cases in which no traces of meningeal inflammation were found on *post-mortem* examination. If such cases can be fully made out, they will afford very strong ground for the opponents of the theory that the inflammation is primary. Cases VI. and VII., pages 45 and 47, are in point. In those, we are told, no traces of inflammation within the cranium were detected. It would have been more satisfactory, however, if it had been definitely stated whether there were or were not *dryness* or *opacity* of the meninges. Those changes were found without other lesion in some of the more rapid and violent cases reported by French authors, by whom

they were yet considered instances of cerebro-spinal meningitis. Instances occurred, too, it will be remembered, in the old New England epidemic, where, in rapid cases, only turgescence of the cerebral vessels was found; whence the observers concluded, not that inflammation was absent, but that it had not time to develop so as to leave traces evident to the eye. But we may appropriately introduce here the concluding portion of a letter (already referred to), kindly forwarded to us, at the request of Surgeon General Barnes, by Assistant Surgeon J. J. Woodward, Brevet Major U. S. A.

"A large number of interesting histories of cases and accounts of autopsies have been collected from the reports of medical officers, and several specimens of the brain and spinal cord, in these cases, have been received at the Army Medical Museum. The medical history of the war, now preparing in this office, will contain a careful discussion of this material, which is not yet ready for publication. In a general way, however, I am permitted to inform you, that there were at least two classes of cases brought under the observation of this department. In the first, the autopsy disclosed grave anatomical lesion of the cerebro-spinal axis, accumulations of serum, sero-pus, pus, or tough yellow lymph, especially in the ventricles about the base of the brain, and in the upper part of the spinal canal. In the second class of cases, no perceptible anatomical lesion in the cerebro-spinal axis was observable. These two groups of cases rest upon equally reliable evidence, and are not to be disposed of on the supposition that the latter represent merely an early stage of the former, since it is to be remarked that *both* anatomical conditions appear to have been found indifferently in protracted cases as well as those which proved suddenly fatal. For a full discussion of this interesting subject I must ask your patience until the official publication of the medical history of the war. A judicious compilation of the experience of the medical department, as to any one disease, is not possible until the exhaustive examination of *all* the records of the office now progressing is completed,

since at every step new facts are acquired, and the premature publication of fragmentary and incomplete information would be the more deplorable, as a comparatively brief period will bring the whole into a proper shape for communication to the medical world."

We await with great interest the publication of the valuable work referred to in the preceding extract. When that shall appear, the morbid anatomists will probably tell us what interpretation to put upon the results of the autopsies. We therefore here leave the question—whether or not the inflammation in spotted fever is primary—*sub judice*. But in the mean while we may state some of the theories held among those who advocate the negative side of the question.

Further Statement of Opinions concerning "Spotted Fever."—Some of those who deny that the inflammation in the disease before us is the primary pathological fault, claiming that the *fons et origo mali* is behind the inflammation—as for example in the blood—are disposed to classify cerebro-spinal meningitis with certain other affections corresponding more or less with it, but in which the local manifestations during life and after death relate to other tissues or organs than the meninges. Especially has it been assimilated to *typhoid pneumonia*. In casting about for leading facts which might bear upon this theory, we came across the following, which we offer in its behalf, so far as relates to the affection last mentioned.

One of our Massachusetts correspondents has mentioned that the spotted fever in his town was followed by an epidemic of typhoid pneumonia, in which there was great correspondence—*mutatis mutandis*—in the symptoms of the two sets of cases. In like manner the old spotted fever, so-called, was followed in a portion of New England by an epidemic of typhoid pneumonia, in which, as Dr. James Jackson informs us, there was a good deal of similarity between some of the leading symptoms and those of the recognized spotted fever of that day.

Dr. Burne, of the Westminster Hospital, England (as Dr. Condie states in his edition of Watson), mentions that a great number of cases of what he calls the "spotted fever" were brought into that institution in the year 1838. He describes the affection as "an adynamic or typhus fever, combined with a latent and dangerous pneumonia, and exhibiting on the surface a very regular and uniform spotted eruption—*not petechiæ.*"

On searching the pages of Grisolle for information on the subject, we found a description of an epidemic of typhoid pneumonia observed by himself. He mentions having seen in some of the cases *petechiæ* and *ecchymoses.* Grisolle strikes the key-note of our modern "Humorists," when he says that judging only by the cases he had observed, the intensity of the typhoid symptoms was almost always in inverse proportion to the space occupied by the pneumonia; a circumstance demanding, he asserts, the admission that the *pulmonary inflammation constituted only an epiphenomenon, and that it was the consequence of some general alteration of the solids or fluids of the economy.*

In this connection it may also be interesting to recall the apparent metastasis from the head to the lung, and thence to other organs, with subsequent return to the head, in one of the five additional cases from Montague contributed by Dr. Deane. (Pages 115, 116.)

The theory in support of which we have collated the preceding facts (without intending, however, to mingle in the discussion), sets forth that in the so-called epidemic cerebro-spinal meningitis, and in typhoid pneumonia, &c., an essential disorder common to them, and assumed to be behind the inflammation, manifests itself, now in the head and spinal canal, by cerebro-spinal meningitis, now in the chest by typhoid pneumonia, and so on; and that the inflammation in the affections thus affiliated to each other bears the same relation to the essential disorder, that the sore throat in scarlatina bears to the general affection of the system in the latter disease. At least such seems to us to be the drift of the theory.

Dr. Levick (in the American Journal of Medical Sciences, No. 48, page 139) states it as his belief that there is an epidemic influence which shows itself in its mildest form as influenza; again as typhoid pneumonia; once more as cerebro-spinal meningitis; while in some cases the blood itself appears to be greatly affected without presenting at once the phenomena of disease of any special organ.

Connection with Diphtheria. Finally, diphtheria has in the same way been associated by some with cerebro-spinal meningitis.* Those who favor the theory of connection between these two diseases, are entitled to the benefit of the following facts reported on previous pages.

Dr. C. E. Ware says in his remarks (No. XXXIV.) on his cases, in several of them (seven in number) "diphtheria unequivocally existed. In one family where there were four cases unquestionably of the same disease" [spotted fever or cerebro-spinal meningitis], "the petechial eruption and the diphtheritic condition of the throat existed in some but not in all." It is fortunate for the cause of science that these cases fell into the hands of one whose diognosis is above question.

Dr. L. E. Marsh, of Granby, also says, "in one case, a girl of 15, there was complication with diphtheria."

A case, not quite so much in point, perhaps, but highly interesting, was reported by Dr. W. W. Greene, of Pittsfield. After remarking that the exudation seen upon the meninges at his autopsies resembled very much that of diphtheria, Dr. G. says one man was violently attacked with cerebro-spinal symptons, and abundant spots lasting for two days, when a copious exudation occurred in the throat, "and all the pain, delirium, opisthotonos, tenderness, &c., disappeared."

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* We would refer here to the statement of one of the writers on the old spotted fever, that he generally found soreness of the throat in his cases when he looked for it.

We would remark that the co-existence of spotted fever or cerebro-spinal meningitis with diphtheria, typhoid pneumonia, &c., does not appear to the writer to *necessitate* the supposition that these affections are manifestations of zymotic or other general disorder behind them; but is equally well explained, perhaps, by the theory of simple typhoid inflammation.

One other hypothesis which we have never seen distinctly set up, seems to have been shadowed forth in some statements of facts. It is this: that while the true epidemic is purely a form of cerebro-spinal meningitis, there have been cases which have passed for instances of it, but which really consisted in other morbid conditions, modified or colored, as it were, by the prevailing epidemic influence. This would be an easy method (perhaps too easy) of explaining the cases mentioned on preceding pages, in which the post-mortem appearances were less indicative of meningeal inflammation than the symptoms.

DIAGNOSIS.*

Typical Cases. Observers will, we believe, concur in the statement that while all the symptoms are not represented in any one case, probably no two cases have the same groups of symptoms. A disorder, then, the pathology of which is undetermined, and in which the groups of phenomena are various in different individuals, would seem to be difficult of recognition. Yet, when fully developed, it need hardly be mistaken; and, *as a general thing*, those who have seen cases will, we think, know it when they meet with it. Its combinations of symptoms, when well declared, are peculiar; cluster around the cerebro-spinal axis, and are usually very rapid in their invasion. Also, the "process of exclusion" is of much avail.

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* See Appendix A.

Cases Masked at the time of Invasion. When, however, the invasion is not sudden, as frequently happens, the formative stage may be insidious. If, then, the affection in question being prevalent, a person complains of headache, chilliness and nausea, not traceable to some other source, the physician, we would suggest, should be on the alert for this disease. Other symptoms, also, referable to the cerebro-spinal axis, and not pointing clearly to a different cause than the disorder under investigation, may be looked upon with suspicion.

Obscure Cases. But sometimes the symptoms are obscure during a great part or the whole of the disease, as in Case XI., page 56. When this is the fact, we know of no better guide than a careful comparison of the symptoms with the admirable description of them by Dr. Upham (quoted on page 22), and with other recorded cases. In rare instances, perhaps, where this disease is suspected, *doubt* will be the only rational opinion.

PROGNOSIS.

If the behavior of spotted fever or cerebro-spinal meningitis in this State be an index of its general course, we may deduce the following corollaries from our statistics of its *duration* and *termination.* First, the prognosis, during the first few days, at least, is grave; secondly, after four or five days have elapsed, if fatal symptoms be not present, the prospect becomes more hopeful; thirdly, the patient is not safe, even in convalescence, since there have been instances of fatal relapse.

THE NOMENCLATURE

Waits upon the pathology. With those who hold that the disease, on which we have been reporting, is a form of *typhus,* it has already been generically named. The views of some would, perhaps, be comprehended under the term *Typhoid*

Meningitis. Others would seem to consider "spotted fever" a peculiar *Toxæmia.* But, till the pathology be better settled than at present, we shall probably continue to speak of "*Spotted Fever,*" or "*Cerebro-Spinal Meningitis.*"

The Report is respectfully submitted.

For the Committee,

LUTHER PARKS, Jr., M.D.
Chairman.

Boston, May, 1866.

APPENDIX.

A.

At our request, Dr. C. G. Page, of this city, sent us the following note upon the *diagnosis* of the disease treated of in the Report.

"Boston, July 16, 1866.

"*Dear Dr.* :—There is a single point in relation to cases of Cerebro-Spinal Meningitis, as they have occurred under my observation, that deserves to be recorded.

"I refer to the very great difficulty in distinguishing the disease in its incipiency from the lighter forms of febrile attacks, or from simple disturbance of the system by slight indigestion.

"Several of my cases presented this condition. One especially I recall, where there was only a general feeling of *malaise* in the morning, the patient having been perfectly well the day previous; at noon he was prostrate, and at night he died. I know of no means by which the disease could have been recognized when this patient first presented himself. Yet at noon it was clear enough. The knowledge of other cases existing, or an epidemic tendency to febrile diseases, should put us on our guard against giving careless or hasty opinions, in all cases where there is in our own minds the slightest doubt in relation to the simple symptoms first brought to our notice, and prognosis should be very guarded. I doubt whether, in the case alluded to, had the disease been recognized in the morning, medicine or treatment would have been of value. Very truly yours,

"*Dr. L. Parks.* Calvin G. Page."

B.

We received (too late to embody in the Report) from William Lester, M.D., of South Hadley, a circular from which we derive the following four cases. They occurred in Granby and South Hadley; in December 1864, March 1865, January 1866. Dr. Lester had no idea of the source of the disease. It showed no preference for localities "high or low—damp or dry"; "districts thickly or sparsely settled"; "the wealthy or the poorer classes." Three of the patients were adults. The average age was 26 years. The greatest age was 60 years, the earliest age 4 years. There were no evidences of contagion. The average duration of the cases was about 8 weeks; the greatest duration, 16–17 weeks; the shortest, one week. Three cases had convulsions. Two of the patients complained much of headache, which in one of them was very severe. Two were delirious; but could be roused to give logical answers. There was severe opisthotonos in one, slight in two. Tenderness at nucha was found in two. The pulse was hard and full in the patient aged 60 years, giving about 90 beats per minute. The pulse was generally feeble, and quick. There was usually not much pain in the bowels, which were generally constipated; the evacuations "showing a want of healthy bile." There was retention of urine in one case. In one case only were there petechiæ. They were upon the chest. In the child of 4 years there was great hyperæsthesia of the surface. The slightest touch would make it cry out, and bring on severe opisthotonos and spasms. It did not recover its speech for five weeks from the commencement of convalescence.

The treatment was "sometimes tonic and stimulant; at others sedative, with dry cupping and blisters."

Three of the patients recovered, and one died. There was no autopsy.

C.

The following case was sent to us May 26th, 1866, by P. L. B. Stickney, M.D., of Chicopee, Mass.

"The history of the case is peculiar. The patient was an unmarried girl aged 30 years, and who on a visit to Brooklyn, New York, was made the victim of a fraud practised upon her by an unprincipled physician, who in order to cure

her of a 'uterine difficulty,' as he termed it, she not being well, committed upon her a rape, as so decided by the Court of that State, and was accordingly punished. She became pregnant, and at term was delivered with instruments after a protracted and severe labor. Convalescence was slow, and she was still weak, when six months after the delivery she attended the Court at Brooklyn, at the trial of the physician. She took a severe cold, and on returning home was taken sick, Dec. 21, 1865. The case proved to be meningitis. The disease commenced with most violent pain in the head, over the eyes, extending to the top of the head, and finally to the back portion, and proceeding down the spine. This pain was most excruciating, causing the patient to shriek and scream violently. The patient soon became delirious, and spasms of the upper and lower extremities followed. The head was drawn back, with rigidity of the muscles of the body. There was no great degree of heat of the body; the pulse rose to 110 to 115; respiration proportionally quickened. The tongue was red around the edges, with a yellowish fur in the middle; the thirst quite considerable; the eyes staring, the sclerotica tinged, and slightly yellow, as also the skin of the body. At intervals the pain in the head and back would slightly abate, and the delirium would pass off, but would again recur on the return of the pain. There was nausea, with tendency to vomiting.

"The treatment was first an active purge of calomel combined with opium, followed by black draught, sinapisms to the spine, cold upon the head. The action of the cathartic produced a large discharge of black fetid fæces, accompanied with a copious urinary discharge. In order to quiet the pain and allay the spasmodic tendency, full doses of morphine were administered, and counter-irritation applied to the spine. This was the treatment for the first few days. No abatement of the symptoms, excepting less delirium. On the third day pain less in the head; less in the cervical, but more in the dorsal and lumbar portion of the spine, proceeding down the lower limbs, causing them to contract spasmodically. The pain also extended around the hips, through the bowels, and left side. There it was excruciating. The patient was obliged to lie on the right side, with the knees drawn up. She moaned bitterly. Pulse 110. Skin inclined to be cool and moist. Thirst slight, tongue dry and furred, edges looking red.

"*Treatment.* Small doses of calomel and opium, with full doses of morphine at intervals to allay the intense pain and

procure sleep; counter-irritation to the spine; hot fomentations on the side and bowels. On the fourth day the spots appeared upon the face, chest and upper part of the body. Pain more or less severe in the head and throughout the whole length of spine. The skin became very sensitive, and patient complained of prickling sensations, declaring that "worms were crawling over her." Could not bear the weight of the bed-clothes; continued to lie with the legs drawn up, and on the right side; very sensitive to the light and to sound, and could not endure the smell of the cooking arising from the kitchen. In fine, all the senses were exquisitely acute and sensitive. The bowels were again moved, the evacuations now yellow and less offensive. Urine somewhat scanty and high colored. Skin cool, some perspiration; pulse 95. As the bowels had been well moved, the calomel was discontinued, and as the morphine had failed to induce sleep or to allay the spasmodic tendency, I gave the tinct. Cannabis Indica, in 15 drop doses every four hours. The diet during this time was light, but nutritious. The pain was peculiar in its course. It would commence in the head, pass down the spine, thence around the side and bowels, producing the most intense agony, then suddenly leaving, run rapidly down the course of the sciatic or femoral nerve, and attack the heel or top of the foot, remaining awhile, then going over to the other foot, then up the leg, then up to the head—hopping about here and there all over the body. It was most piercing and violent, like neuralgia. At intervals, when the pain was less violent, the patient would sink into a state of stupor, the muscles of the throat and mouth become rigid, the jaws closed and firmly pressed together, the breathing slow and at last hardly perceptible. This state would continue for one or two (and once or twice it continued three) hours, when suddenly the patient would rouse up, look about, perhaps call for something to drink, and say she felt better. This would continue a short time, when the pain would come on, and the same exhibition of symptoms would take place. This stupor was not the effect of the Cannabis or morphine, for it came on all the same whether it was given or omitted. The action of the Cannabis seemed simply to control the pain and spasm. This treatment was followed up with cold and counter-irritation applied to the spine, and the patient gradually improved. At the end of three weeks she had so far recovered as to sit up long enough to have her bed changed. One day (Jan. 15, 1866), however, contrary to directions, she was induced, by the injudicious

advice of her friends, to have her clothes put on, and to 'move about a little, and thus get strength faster.' The consequence was that the 'getting up' was overdone and the patient undone. A relapse followed; all the symptoms returned with redoubled fury. The pain was excessive, and not only affected the head and spine, but every organ in the body. The skin and the sclerotic coat of the eye became of a dark yellow; the urine was almost black, and passed with the greatest suffering; great and constant nausea, with occasional vomiting of a dark colored fluid, set in.

"The pain in the bowels was intense, especially in the region of the bladder. The menses made their appearance, copious and very dark in color. Pain in head and back was less violent, but more in the side and bowels. The skin was inclined to be cold; pulse 78; appetite gone; tongue quite clean. *Treatment*—Cannabis continued, with quinine one to two grains every four hours; brandy, beef tea, &c. Cold was applied to the spine.

"The state of stupor became more prolonged, the strength holding out remarkably. Iron and the whole tonic and stimulating treatment was thoroughly carried out. This continued about a week, when the pain in the pelvic region became intense, the patient complaining of a weight, a 'bearing down.' A vaginal examination revealed nothing. No pain of the neck and substance of the womb and bladder, and yet the pain on passing water would cause the patient to cry out in agony. The bowels were moved in the mean time, producing copious dejections of dark-colored fæces. This state of things continued till the 20th day of February. The Cannabis had lost its power, and the different forms of narcotics were tried in succession. Different applications to the spine were used. Ergot was not tried, as I had seen it used in another case with not the least good effect whatever. The different alkaloids, strychnia, veratrine, &c. were all tried, and, so far as I could judge, not the least benefit was derived from anything of the kind. At this period the pain suddenly left the pelvic region, and attacked the chest and stomach with the same degree of violence. Pain in the head very much less; in the spine, about the same. Up to this time the patient had taken considerable food. Beef tea, gruel, toast, anything which she would eat, that was nutritious, was allowed. Now, Feb. 25th, commenced the exhibition of a different series of symptoms. Nausea commenced; pain in the stomach and chest increased; strength began to fail. Sufferings at times intense; stupor more frequent; finally vomiting

commenced. Skin of a deep, dark yellow; petechiæ here and there; urine dark brown, thick; extremities feeling numb and cold; pulse 70; tongue clean. The peculiar sensitiveness of the body gone. Could bear light and sound, but the sense of smell very acute; cannot bear any smell of food, intense loathing of it. Pain in the chest and stomach intense. The fluid vomited was of a dark brown color, at times black, resembling, I should judge, that which is vomited in yellow fever. Nothing had the least effect in stopping this vomiting. Counter-irritation over the stomach, local application of any kind, seemed rather to increase it. Anything taken into the stomach would induce it. Its very presence in passing down the throat would bring it on. This vomiting continued for *twenty-seven days*, and during that time not a particle of food was retained on the stomach. During this time she would occasionally take a little warm gruel to enable her to vomit the more easily, but it would seem to be all returned. In order to allay the pain, and as all kinds of medicine taken by the mouth only aggravated the vomiting, I allowed her to inhale a few drops of chloroform. This gave her the only relief she got. While under its influence she would lie quietly, but as soon as it had passed away she would most piteously beg for more. At the end of the 14th of March she began to vomit a thick grumous substance, which on examination proved to be *blood*. In the course of two or three days the hæmatemesis was fully established, and at times she would vomit a pint or more of dark clotted blood, and at one time the nurse, a very intelligent person, estimated it to be not less than a quart. At this time nothing was retained on the stomach, and the idea of taking either food or medicine or any outward application, would induce the vomiting. Only the chloroform gave any relief. I tried nit. argenti with belladonna, also the sub-sulphite of soda; in fine, everything which seemed likely to do good, but without avail. The mind at this time was remarkably clear and composed. No delirium, and the turns of stupor less frequent. About ten days before she died, blood began to ooze from the gums and lips, and finally from the chin and at the junction of the alæ of the nose and cheek, also from the forehead It came also from the tips of the fingers of one of the hands. Dark purple spots appeared upon the body, and there seemed to be a purpuric condition of the whole system. She gradually sank, and death closed the scene of suffering, March 24th, 1866, the patient having been sick ninety-three days." * * *

By a misunderstanding on the part of the friends of the patient, Dr. Stickney lost the opportunity of making a post-mortem examination.

"The pathology and treatment of the malady, says Dr. Stickney, 'seem to me not as yet to be understood. I have seen some phases of it, I think, in a modified form, and in connection with the exhibition of other forms of disease, of which I can give myself no intelligent response, unless this disease is either at the bottom or in some obscure manner connected with them.'"

D.

The following cases are from the Records of the Boston Society for Medical Improvement (for 1866).

MAY 28th.—*Cerebro-spinal Meningitis.*—Dr. MORLAND reported the case, the following account of which is prepared from the record furnished by Dr. J. F. A. Adams, resident graduate in the Medical Department of the City Hospital.

G. W. T., twenty-eight years old, was admitted into the Boston City Hospital, May 24th, 1866, at 3 o'clock, P.M. He was at once seen and prescribed for by Dr. Adams. Very little of his previous history could be obtained. A friend, who came with him, stated that he was unmarried, and that, since he had known him—about two years—he had not been very strong, but that he was a quiet, temperate man. He was a dealer in photographs, and a resident of Boston. His father and a brother, it was stated, died of phthisis.

He was taken ill on May 20th, and is said to have been in a state of stupor during the first few days. Dr. George Derby, Admitting Physician to the Hospital, on first seeing him, supposed him to be intoxicated, but immediately discovering him to be very ill, sent him at once to the Hospital. On admission, he was almost completely unconscious, groaning and crying, as if in great pain, which, so far as could be ascertained, was in the head, and especially on the left side, and over the upper part of the forehead, upon which he constantly kept his hand. When aroused and asked if he felt pain elsewhere, he replied that he "did not know of any." The pupils were contracted, the pulse 68, very full, hard, and irregular. He was exceedingly restless. A slight sero-purulent, dark-colored discharge from the right ear was noticed. A sinapism was applied to the back of the neck, and a scruple of the

bromide of potassium was administered. At 7 o'clock, P.M., large sinapisms were applied to the calves of the legs, and the dose of bromide was repeated, and continued, every two hours, through the night. During the evening, six leeches were applied behind each ear, and the bleeding was very free after their removal. The urine was drawn off by the catheter, and was of a very dark, coffee color. The pulse rose to one hundred after the leeching, and became softer and more regular, but was still very variable. The pupils were then observed to be dilated, and they remained so. A few dark-colored, minute spots, not fading on pressure, were observed upon the chest.

The patient was seen by Dr. Morland about 10 o'clock next morning, May 25th. The pulse was then 120, and exceedingly small and weak; there was some sordes upon the teeth; the spots upon the chest were the same. The bowels had not moved since admission. A warm salt-and-water enema was directed; also an ice-bag to the head, and wine and water, freely. The patient was exhausted, and very restless during the entire day, crying and moaning, as if in pain, and quite unconscious. The enema produced a free evacuation of dark-colored fæcal matters. The urine passed involuntarily. Gruel was swallowed without much difficulty. In the afternoon, the pulse was weaker and exceedingly irregular—varying from 80 to 160, within a few minutes, and almost without rhythm. A vapor-bath was used, in bed, and a tolerably free diaphoresis was obtained. The patient became more quiet after the bath, and the pulse was 152, full, soft and regular. The relief, however, was only temporary, and he continued in his previous condition, with the exception of increasing weakness, until 4 o'clock the next morning, when he died, about 37 hours after admission.

The nurse stated that she had observed convulsions, of short duration, but it could not be positively determined whether these were any thing more than the violent jactitations which were constantly present. There was certainly no opisthotonos.

On examination of the urine, *albumen* was found to be abundant, and the microscope revealed *granular casts* and *pus-cells*. *Urea* could not be detected.

In reference to the *diagnosis*, it was not easy to make a decision. Typhoid fever was suggested by the stupor, the sordes and the general condition. The spots upon the chest were not "rose-spots," nor were they of a purpuric nature. The somewhat dubious report as to the occurrence of convul-

sions, in connection with the results of the examination of the urine, suggested uræmia. It is fair to add, that, although cerebro-spinal meningitis was mentioned, in this connection, no positive diagnosis was made. The account of the *post-mortem* examination, which was made by Dr. C. W. Swan, Pathologist to the Hospital, is appended. The specimen was shown to the Society by Dr. Swan.

Autopsy.—May 27th, 9 A.M.—Membranes of the brain rather dry. A sub-arachnoid deposit of opaque, yellowish fibrin over the upper and anterior parts of each hemisphere, particularly towards the median line—at the base of the brain, extending into the various fissures, and upon the superior and cuneiform process of the cerebellum.

The whole length of the spinal cord was enveloped in a similar deposit, which was, however, less in amount towards the upper extremity than elsewhere. *Lungs* pale, healthy. *Liver* and *kidneys* rather dark. The *stomach* was distended with gases, and contained bright, olive-green fluid in large quantity. The *heart* was firm. Fibrinous coagula in both sides. Right auricle and vena cava distended by soft black coagula. About half an ounce of serum in the pericardium.

Dr. H. K. Oliver said he saw this patient previous to his application for admission to the City Hospital. The first day of his illness great complaint was made of pain in one of the ears, the membrana tympani of which was much congested: the next day there was a great discharge of pus with a little blood from the same ear; there were then no symptoms of meningitis.

Dr. Jackson suggested that in this case the inflammation might have extended from the ear to the membranes of the brain. He said this might take place though the bone intervening was perfectly healthy, and instanced several cases of the kind which had come under his observation.

Dr. Oliver said the same idea had occurred to him.

June 11th.—*Cerebro-spinal Meningitis; Death; Autopsy.*—Dr. Blake reported the case.

Miss L. R., 26 years old, was admitted to the City Hospital June 2d. For a year has had otorrhœa, with deafness, for which she has been treated by an irregular practitioner, by means of injections, &c., without relief. Five days ago, the present trouble commenced, with headache, confusion of thought, and a feeling of general *malaise*. Two days after, she was obliged to keep her room, had pain in her back, weakness of knees, and a good deal of febrile action. Was

seen by a physician, who, after an examination of her case, thought her symptoms indicated commencing varioloid. During the evening of this day, she first noticed pain and stiffness of the posterior cervical muscles, and shortly afterwards was seized with severe cephalalgia, loss of consciousness to some degree, slight strabismus and opisthotonos, and had remained in that condition up to the time of entrance.

On admission, the opisthotonos was found very well marked—head thrown back, body arched, legs stiff, &c.—almost wholly unconscious; mouth partly open, *and lips covered with little herpetic vesicles;* eyes half closed, with moderately dilated and sensitive pupils; respiration labored and noisy, 32; pulse 120, regular; tongue dry and brownish; sordes on teeth. A number of dark, purplish-looking spots, one eighth of an inch in diameter, noticed on chest, neck and arms; spots not raised, do not disappear on pressure.

Leeches behind ears, ice to head, and bromide of potassium, in large doses, were prescribed. Liquid nourishment by rectum, if unable to swallow. Next day, the opisthotonos had disappeared, but the cervical muscles continued rigid; she could swallow liquids without much difficulty; pulse had come down to 90; pupils somewhat dilated and sensitive; still unconscious; fæces and urine passed involuntarily.

The following day she was in about the same state—respiration and pulse a little quickened; rigidity of muscles as marked; no return of consciousness. Next day she died. The following is the report of the *post-mortem* examination, as made by Dr. Swan.

Examination, 10 hours after Death.—Head. The large vessels of the pia mater, on the upper surfaces of both hemispheres, particularly about the vertex, were turgid with blood, and the minute vessels lying on the convolutions were unusually distinct. There was a sub-arachnoid deposit of soft, greenish-yellow lymph in many places on the upper surfaces of the hemispheres, at and between their anterior extremities, in the fissures of Silvius, at the optic commissure, on the pons Varolii at the anterior edge of the cerebellum, and on its superior vermiform process. Lying free upon that portion of the dura mater which covers the upper surface of the right hemisphere, was a continuous, uniform layer of lymph two or three square inches in extent. A less amount, in small, scattered particles, occurred upon corresponding portions of the left side. There was no excess of fluid in the serous cavities of the brain or cord: the brain-substance was firm; the puncta cruenta large.

Beginning five inches from the upper extremity of the spinal cord and extending downward about seven inches, was a thick, unbroken deposit of soft, pale, greenish-yellow lymph. It was entirely confined to the anterior aspect. On the posterior surface, the minute vessels seemed slightly injected, but there was no trace of lymph.

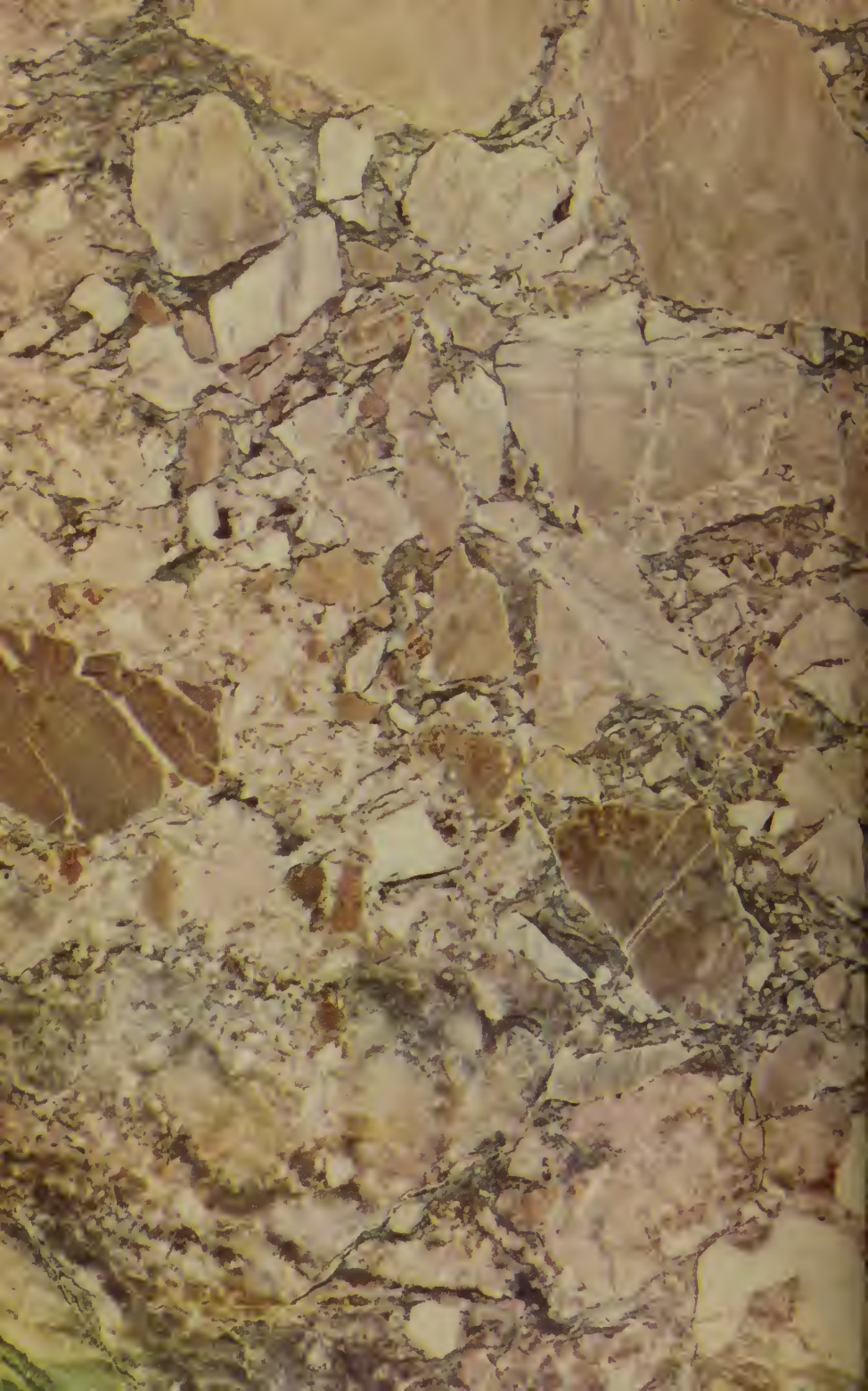
In the left pleural cavity, ten ounces of a turbid brownish liquid, sustaining fat globules on its surface. The two principal pulmonary veins of the left lung, and the left primary and two secondary bronchi, were laid bare to the extent of one or two inches, and several venous branchlets were completely isolated for an inch, more or less, by a curious superficial progressive waste of the parenchyma of the lung. This process was most marked on the inner surface of the lower lobe, but it had invaded a portion of the upper lobe nearest its roots and had also extended between the two lobes. It had destroyed at least the pulmonary pleura in its course, the line of demarkation being in general easily made out, but there was also undoubted loss of proper lung tissue towards the centre of the diseased action, although the finger found no deep cavities. The bare parenchyma presented a rather smooth, lobulated surface of a deep brown color. There was little or no odor about the parts. The posterior and upper surface of the lower lobe showed small hæmorrhagic blotches beneath the pleura. Section showed considerable lobular pneumonia. The same disease, to less extent, existed in the right lower lobe. Rest of lungs healthy. Other organs normal.

E.

In addition to the few cases given above as having occurred in 1866, we have seen it stated that "spotted fever" invaded, during the early part of the present year, the Seminary in Pittsfield, which suffered from an endemic of typhoid fever a few years since. Of the cases in this recent invasion of Pittsfield we have not been so fortunate as to obtain details.

Of course we have not sufficient data to enable us to say whether or not "spotted fever or cerebro-spinal meningitis" continues to prevail as an epidemic in this State.

F.

Doubt has been entertained as to the true nature of the endemic denominated "typhoid" in the preceding paragraph, and mentioned as occurring at the Seminary in Pittsfield. That endemic is the one referred to by Dr. C. E. Ware under the head of "Contagion," in table E.

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